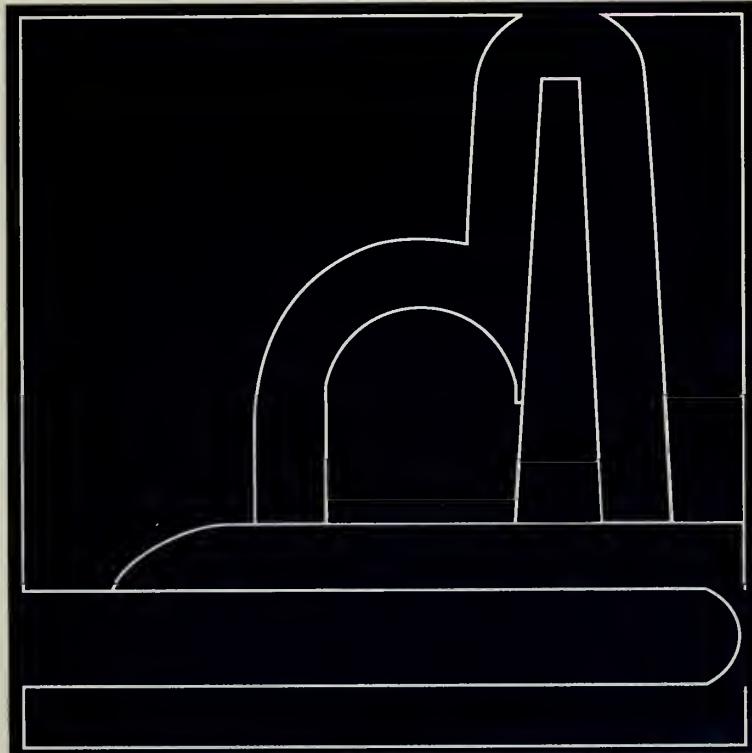


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June 1994

# Nuclear Reactors Built, Being Built, or Planned: 1993



Prepared for:



**U.S. DEPARTMENT OF ENERGY**  
**Director, Office of Nuclear Energy**

Prepared by:

**Office of Scientific and  
Technical Information**

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# **Nuclear Reactors Built, Being Built, or Planned 1993**

Prepared for:

**U.S. DEPARTMENT OF ENERGY**

**Director, Office of Nuclear Energy**

**Washington, D.C. 20585**

Prepared by:

**Office of Scientific and  
Technical Information**

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## Preface

*Nuclear Reactors Built, Being Built, or Planned* contains unclassified information about facilities built, being built, or planned in the United States for domestic use or export as of December 31, 1993. The Office of Scientific and Technical Information, U.S. Department of Energy, gathers this information annually from Washington headquarters and field offices of DOE; from the U.S. Nuclear Regulatory Commission (NRC); from the U.S. reactor manufacturers who are the principal nuclear contractors for foreign reactor locations; from U.S. and foreign embassies; and from foreign governmental nuclear departments.

The book consists of three divisions, as follows:

- a commercial reactor locator map and tables of the characteristic and statistical data that follow; a table of abbreviations;
- tables of data for reactors operating, being built, or planned; and
- tables of data for reactors that have been shut down permanently or dismantled.

The reactors are subdivided into the following parts: Civilian, Production, Military, Export, and Critical Assembly. *Export reactor* refers to a reactor for which the principal nuclear contractor is a U.S. company—working either independently or in cooperation with a foreign company (Part IV). *Critical assembly* refers to an assembly of fuel and moderator that requires an external source of neutrons to initiate and maintain fission. A critical assembly is used for experimental measurements (Part V).

Various classes of reactors within these parts are defined as follows:

**Central-Station Electric Power Plant:** A nuclear power facility designed and constructed for operation on a utility system (Part I, Section 1A).

**Dual-Purpose Plant:** A nuclear power facility designed, constructed, and operated for more than one primary purpose, for example, the production of nuclear materials and the generation of electricity or the use of reactor thermal energy for electrical generation and process-heat applications including desalting (Part I, Section 1B).

**Experimental Power Reactor:** A facility designed, engineered, constructed, and operated to test the technical feasibility of a concept or to provide the technical basis for a similar type nuclear power plant in a larger size. Design flexibility permits changes to prove various aspects of reactor technology including fuel, components, and configurations. Power-conversion equipment may or may not be included as part of the facility (Part I, Section 2).

**General Irradiation Test Reactor:** A reactor having (1) a thermal power level exceeding 10 MW; (2) test loops or experimental facilities within, or in proximity to, the core; and (3) the use

of nuclear radiation for testing the life or performance of reactor components as its major function (Part I, Section 3A; Part IV, Section 2A).

**High-Power Research and Test Reactor:** A reactor having a relatively high thermal power level (5MW or greater) but not classed as a general irradiation test reactor (Part I, Section 3B).

**Safety-Research and Test Reactor:** A reactor associated with a nuclear safety research or engineering-scale test program conducted for the purpose of developing basic design information or demonstrating safety characteristics of terrestrial and aerospace nuclear reactor systems (Part I, Section 3C).

**General Research Reactor:** A reactor—excluding that located at a university—whose nuclear radiations are used primarily as a research tool for basic or applied research and whose thermal power level is 10 MW or less. It may include facilities for testing reactor materials (Part I, Section 3D; Part IV, Section 2B). Also included are Research Reactors (Part III, Section 3B).

**University Research and Teaching Reactor:** A reactor located at a university and usually operated for the primary purpose of training in the operation and utilization of reactors and for instruction in reactor theory and performance (Part I, Section 3E; Part IV, Section 2C).

Reactors are further grouped according to status:

Reactors are listed as *operable* under the following circumstances:

1. Reactors regulated by the NRC
  - when an operating license is issued.
  - when a reactor is temporarily shut down because of technical reasons, modifications, or refueling.
2. Federal Government reactors
  - when criticality is achieved.
  - when a reactor is temporarily shut down for safety improvements.
3. Reactors for export
  - when criticality is achieved.

Reactors are listed as *being built* under the following circumstances:

1. Reactors regulated by NRC
  - when a construction permit is issued.
  - when limited work authorization is issued.
2. Federal Government reactors
  - when ground is broken.
  - when components are ordered.
  - when a construction contract is awarded.

### 3. Reactors for export

- when an application for an export license is received by NRC.
- when reliable information is received relating to the fabrication of reactor components.

Reactors are listed as *planned* under the following circumstances:

#### 1. Reactors regulated by NRC

- when a public announcement that includes the principal vendor supplier is made by the sponsoring organization.
- when an application for a construction permit is received by NRC.

#### 2. Federal Government reactors

- when a public announcement is made by the agency involved.
- when the project is otherwise appropriately authorized.

#### 3. Reactors for export

- when a public announcement that includes principal contractor and reactor type is made.
- when NRC receives information that a U.S. reactor manufacturer is proceeding with preconstruction design and development on the basis of a letter of intent.

Reactors are considered to be *shutdown or dismantled* under the following circumstances:

#### 1. Reactors regulated by NRC

- when the licensee has applied to the Commission for authority to surrender a license voluntarily and to dismantle the facility and dispose of its component parts. A reactor shut down because of technical problems, modifications, or refueling, continues to be listed as operable.

#### 2. Federal Government reactors

- when the facility has ceased operation and the agency has declared officially that the agency does not intend to operate the reactor further. However, within this category, a few reactors are identified as being in *standby* mode, the condition in which documentary authorization exists to maintain the reactor for possible future operation.

### 3. Reactors for export

- when the plant is officially declared shut down by the owner and taken out of operation permanently.

Table 2 presents a statistical summary of reactors, other than critical assemblies, in each class and status. Shutdown and dismantled reactors are included since such facilities have made significant contributions to reactor technology.

The reactor tables have the following column headings:

- *Location.* The city and state or country where located originally. For a portable facility or one that has been relocated, the most recent location is given.
- *Principal nuclear contractor, operator, designer, ship-builder.* The abbreviations used in this column are spelled out in Table 3, which appears just before the reactor tables.
- *Type.* Entries in this column are based on coolant, moderator, and neutron energy.
- *Power.* MD capacity [MW(e)] is the maximum dependable capacity (net electrical output to grid) for plants having an operating history. Otherwise, it is the design capacity. Licensed power and authorized power are given where appropriate.
- *Designation.* The common name, abbreviation or acronym used for the facility. For the naval reactors, it is the hull number.
- *Date* columns. The initial criticality date, year of operation, and year of shutdown are given as appropriate.

*Nuclear Reactors Built, Being Built, or Planned* (DOE/OSTI-8200-R57) is sponsored by the DOE Office of Nuclear Energy, LaRue E. Moxley, Program Officer.

The participation and assistance of many individuals, agencies, and companies in providing data and updating the entries in this revision are gratefully acknowledged. Comments and suggestions about this publication are welcome. To ensure that the wide range of information included in this publication will continue to be timely and accurate, please direct any information related to updating the items to William F. Simpson, Jr., Office of Scientific and Technical Information, Scientific and Technical Publications Branch, P.O. Box 62, Oak Ridge, TN 37831; (615) 576-1228. Questions of a technical nature should be addressed to Lamar Cason at the same address.

# CONTENTS

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Preface	iii
Map: Commercial Nuclear Power Reactors in the United States	viii
Table 1. Commercial Nuclear Power Reactors in the United States as of 31 Dec 1993	ix
Table 2. Statistical Summary of Nuclear Reactors as of 31 Dec 1993	xv
Table 3. Abbreviations of Contractors, Designers, Shipbuilders, and Facility Operators	xvi

## REACTORS AND FACILITIES OPERABLE, BEING BUILT, OR PLANNED

### Part I. Civilian Reactors (Domestic)

1. Power Reactors	1
A. Central-Station Electric Power Plants	1
B. Dual-Purpose Plants ( <i>No reactors currently in this category</i> )	6
C. Propulsion (Maritime) ( <i>No reactors currently in this category</i> )	6
2. Experimental Power-Reactor Systems	6
A. Electric-Power Systems	6
B. Space Nuclear Auxiliary Power (SNAP) ( <i>No reactors currently in this category</i> )	6
C. Space Propulsion ( <i>No reactors currently in this category</i> )	6
3. Test, Research, and University Reactors	7
A. General Irradiation Test	7
B. High-Power Research and Test	7
C. Safety Research and Test	7
D. General Research	8
E. University Research and Teaching	9

### Part II. Production Reactors

1. Materials Production	11
2. Process Development ( <i>No reactors currently in this category</i> )	11

# CONTENTS (Continued)

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<b>Part III. Military Reactors</b>	
1. Defense Power-Reactor Applications	12
A. Remote Installations ( <i>No reactors currently in this category</i> )	12
B. Propulsion (Naval)	12
2. Developmental Power	15
A. Electric-Power Experiments and Prototypes ( <i>No reactors currently in this category</i> )	15
B. Propulsion Experiments and Prototypes	15
3. Test and Research	15
A. Test ( <i>No reactors currently in this category</i> )	15
B. Research	16

<b>Part IV. Export Reactors</b>	
1. Power Reactors	16
A. Central-Station Electric Power Plants	16
B. Propulsion ( <i>No reactors currently in this category</i> )	20
2. Test, Research, and Teaching	20
A. General Irradiation Test	20
B. General Research	20
C. University Research and Teaching	22

<b>Part V. Critical Assemblies</b>	
1. Civilian	23
2. Military	24

## REACTORS AND FACILITIES SHUTDOWN OR DISMANTLED

<b>Part I. Civilian Reactors (Domestic)</b>	
1. Power Reactors	25
A. Central-Station Electric Power Plants	25
B. Dual-Purpose Plants	26
C. Propulsion (Maritime)	27
2. Experimental Power-Reactor Systems	27
A. Electric-Power Systems	27
B. Space Nuclear Auxiliary Power (SNAP)	29
C. Space Propulsion	30
3. Test, Research, and University Reactors	31
A. General Irradiation Test	31
B. High-Power Research and Test	32
C. Safety Research and Test	32
D. General Research	33
E. University Research and Teaching	37

# CONTENTS (Continued)

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<b>Part II. Production Reactors</b>	
1. Materials Production	39
2. Process Development	40
<b>Part III. Military Reactors</b>	
1. Defense Power-Reactor Applications	40
A. Remote Installations	40
B. Propulsion (Naval)	41
2. Developmental Power	43
A. Electric-Power Experiments and Prototypes	43
B. Propulsion Experiments and Prototypes	43
3. Test and Research	43
A. Test	43
B. Research	44
<b>Part IV. Export Reactors</b>	
1. Power Reactors	44
A. Central-Station Electric Power Plants	44
B. Propulsion	44
2. Test, Research, and Teaching	45
A. General Irradiation Test ( <i>No reactors currently in this category</i> )	45
B. General Research	45
C. University Research and Teaching	45
<b>Part V. Critical Assemblies</b>	
1. Civilian	46
2. Military	46
<b>REACTOR INDEX</b>	47

# COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES

31 DECEMBER 1992

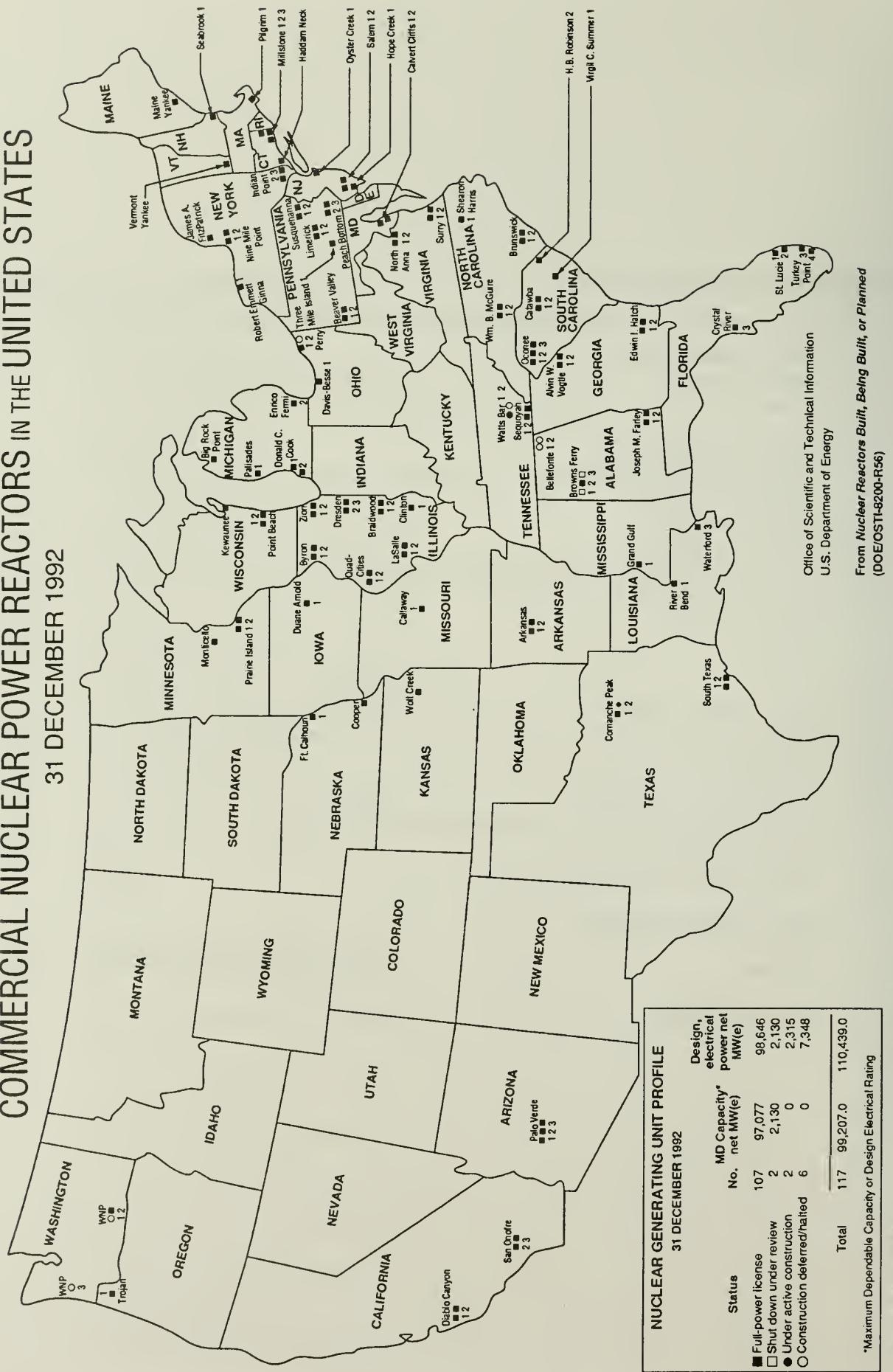


TABLE 1

## COMMERCIAL NUCLEAR POWER REACTORS IN THE UNITED STATES AS OF 31 DEC 1993

SITE	PLANT NAME	STATUS	CAPACITY, NET MW(e)	DESIGN ELECTRICAL RATING, NET MW(e)		LICENSEE	STARTUP
<b>ALABAMA</b>							
Decatur	Browns Ferry Nuclear Power Station, Unit 1	SDUR		1,065		Tennessee Valley Authority	73 08
Decatur	Browns Ferry Nuclear Power Station, Unit 2	FPL	1,065	1,065		Tennessee Valley Authority	74 07
Decatur	Browns Ferry Nuclear Power Station, Unit 3	SDUR		1,065		Tennessee Valley Authority	76 08
Dothan	Joseph M. Farley Nuclear Plant, Unit 1	FPL	812	829		Southern Nuclear Operating Co.	77 08
Dothan	Joseph M. Farley Nuclear Plant, Unit 2	FPL	822	829		Southern Nuclear Operating Co.	81 05
Scottsboro	Bellefonte Nuclear Plant, Unit 1	CDH		1,235		Tennessee Valley Authority	Indef.
Scottsboro	Bellefonte Nuclear Plant, Unit 2	CDH		1,235		Tennessee Valley Authority	Indef.
				2,699	7,323		
	<b>Total</b>						
<b>ARIZONA</b>							
Wintersburg	Palo Verde Nuclear Generating Station, Unit 1	FPL	1,221	1,270		Arizona Public Service Co.	85 05
Wintersburg	Palo Verde Nuclear Generating Station, Unit 2	FPL	1,221	1,270		Arizona Public Service Co.	86 04
Wintersburg	Palo Verde Nuclear Generating Station, Unit 3	FPL	1,304	1,270		Arizona Public Service Co.	87 10
	<b>Total</b>			3,746	3,810		
<b>ARKANSAS</b>							
Russellville	Arkansas Nuclear One, Unit 1	FPL	836	850		Entergy Operations Inc.	74 08
Russellville	Arkansas Nuclear One, Unit 2	FPL	858	912		Entergy Operations Inc.	78 12
	<b>Total</b>			1,694	1,762		
<b>CALIFORNIA</b>							
Diablo Canyon	Diablo Canyon Nuclear Power Plant, Unit 1	FPL	1,073	1,086		Pacific Gas & Electric Co.	84 04
Diablo Canyon	Diablo Canyon Nuclear Power Plant, Unit 2	FPL	1,087	1,119		Pacific Gas & Electric Co.	85 08
San Clemente	San Onofre Nuclear Generating Station, Unit 2	FPL	1,070	1,070		Southern California Edison	82 07
San Clemente	San Onofre Nuclear Generating Station, Unit 3	FPL	1,080	1,080		Southern California Edison	83 08
	<b>Total</b>			4,310	4,355		
<b>CONNECTICUT</b>							
Haddam Neck	Haddam Neck Plant	FPL	560	582		Connecticut Yankee Atomic Power Co.	67 07
Waterford	Millstone Nuclear Power Station, Unit 1	FPL	641	660		Northeast Nuclear Energy Co.	70 10
Waterford	Millstone Nuclear Power Station, Unit 2	FPL	873	870		Northeast Nuclear Energy Co.	75 10
Waterford	Millstone Nuclear Power Station, Unit 3	FPL	1,137	1,154		Northeast Nuclear Energy Co.	86 01
	<b>Total</b>			3,211	3,266		

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	CAPACITY, NET MW(e)	DESIGN ELECTRICAL RATING, NET MW(e)	LICENSEE	STARTUP
<b>FLORIDA</b>						
Florida City	Turkey Point Plant, Unit 3	FPL	666	693	Florida Power & Light Co.	72 10
Florida City	Turkey Point Plant, Unit 4	FPL	666	693	Florida Power & Light Co.	73 06
Fort Pierce	St. Lucie Plant, Unit 1	FPL	839	830	Florida Power & Light Co.	76 04
Fort Pierce	St. Lucie Plant, Unit 2	FPL	839	830	Florida Power & Light Co.	83 06
Red Level	Crystal River Nuclear Plant, Unit 3	FPL	821	825	Florida Power Corp.	77 01
Total			3,831	3,871		
<b>GEORGIA</b>						
Baxley	Edwin I. Hatch Nuclear Plant, Unit 1	FPL	737	776	Georgia Power Co.	74 09
Baxley	Edwin I. Hatch Nuclear Plant, Unit 2	FPL	757	784	Georgia Power Co.	78 07
Waynesboro	Alvin W. Vogtle Nuclear Plant, Unit 1	FPL	1,158	1,101	Georgia Power Co.	87 03
Waynesboro	Alvin W. Vogtle Nuclear Plant, Unit 2	FPL	1,157	1,101	Georgia Power Co.	89 03
Total			3,809	3,762		
<b>ILLINOIS</b>						
Braidwood	Braidwood Station, Unit 1	FPL	1,120	1,120	Commonwealth Edison Co.	87 05
Braidwood	Braidwood Station, Unit 2	FPL	1,120	1,120	Commonwealth Edison Co.	88 03
Byron	Byron Station, Unit 1	FPL	1,105	1,120	Commonwealth Edison Co.	85 02
Byron	Byron Station, Unit 2	FPL	1,105	1,120	Commonwealth Edison Co.	87 01
Clinton	Clinton Power Station, Unit 1	FPL	930	933	Illinois Power Co.	87 02
Cordova	Quad-Cities Station, Unit 1	FPL	769	789	Commonwealth Edison Co.	71 10
Cordova	Quad-Cities Station, Unit 2	FPL	769	789	Commonwealth Edison Co.	72 04
Morris	Dresden Nuclear Power Station, Unit 2	FPL	772	794	Commonwealth Edison Co.	70 01
Morris	Dresden Nuclear Power Station, Unit 3	FPL	773	794	Commonwealth Edison Co.	71 01
Seneca	La Salle County Station, Unit 1	FPL	1,036	1,078	Commonwealth Edison Co.	82 06
Seneca	La Salle County Station, Unit 2	FPL	1,036	1,078	Commonwealth Edison Co.	84 03
Zion	Zion Nuclear Plant, Unit 1	FPL	1,040	1,040	Commonwealth Edison Co.	73 06
Zion	Zion Nuclear Plant, Unit 2	FPL	1,040	1,040	Commonwealth Edison Co.	73 12
Total			12,615	12,815		
<b>IOWA</b>						
Palo	Duane Arnold Energy Center, Unit 1	FPL	515	538	Iowa Electric Light & Power Co.	74 03
Total			515	538		
<b>KANSAS</b>						
Burlington	Wolf Creek Generating Station	FPL	1,134	1,170	Wolf Creek Nuclear Operating Corp.	85 05
Total			1,134	1,170		
<b>LOUISIANA</b>						
St. Francisville	River Bend Station, Unit 1	FPL	936	936	Gulf States Utilities Co.	85 10
Taft	Waterford Generating Station, Unit 3	FPL	1,075	1,104	Entergy Operations Inc.	85 03
Total			2,011	2,040		

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	CAPACITY, NET MW(e)	DESIGN ELECTRICAL RATING, NET MW(e)	LICENSEE	STARTUP
MAINE						
Wiscasset	Maine Yankee Atomic Power Plant	FPL	860	870	Maine Yankee Atomic Power Co.	72 10
			860	870		
	Total					
MARYLAND						
Lusby	Calvert Cliffs Nuclear Power Plant, Unit 1	FPL	830	845	Baltimore Gas & Electric Co.	74 10
Lusby	Calvert Cliffs Nuclear Power Plant, Unit 2	FPL	830	845	Baltimore Gas & Electric Co.	76 11
			1,660	1,690		
	Total					
MASSACHUSETTS						
Plymouth	Pilgrim Nuclear Power Station, Unit 1	FPL	670	655	Boston Edison Co.	72 06
			670	655		
	Total					
MICHIGAN						
Big Rock Point	Big Rock Point Nuclear Plant	FPL	67	72	Consumers Power Co.	62 09
Bridgman	Donald C. Cook Nuclear Power Plant, Unit 1	FPL	1,000	1,020	Indiana and Michigan Electric Co.	75 01
Bridgman	Donald C. Cook Nuclear Power Plant, Unit 2	FPL	1,060	1,090	Indiana and Michigan Electric Co.	78 03
Newport	Enrico Fermi Atomic Power Plant, Unit 2	FPL	1,085	1,116	Detroit Edison Co.	85 06
South Haven	Palisades Nuclear Plant, Unit 1	FPL	730	805	Consumers Power Co.	71 05
			3,942	4,103		
	Total					
MINNESOTA						
Monticello	Monticello Nuclear Generating Plant	FPL	536	545	Northern States Power Co.	70 12
Red Wing	Prairie Island Nuclear Generating Plant, Unit 1	FPL	513	530	Northern States Power Co.	73 12
Red Wing	Prairie Island Nuclear Generating Plant, Unit 2	FPL	512	530	Northern States Power Co.	74 12
			1,561	1,605		
	Total					
MISSISSIPPI						
Port Gibson	Grand Gulf Nuclear Station, Unit 1	FPL	1,143	1,250	Entergy Operations Inc.	82 08
			1,143	1,250		
	Total					
MISSOURI						
Fulton	Callaway Plant, Unit 1	FPL	1,120	1,171	Union Electric Co.	84 10
			1,120	1,171		
	Total					
NEBRASKA						
Brownville	Cooper Nuclear Station	FPL	764	778	Nebraska Public Power District	74 02
Fort Calhoun	Fort Calhoun Station, Unit 1	FPL	478	478	Omaha Public Power District	73 08
			1,242	1,256		
	Total					

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	CAPACITY, NET MW(e)	DESIGN ELECTRICAL RATING, NET MW(e)	LICENSEE	STARTUP
<b>NEW HAMPSHIRE</b>						
Seabrook	Seabrook Nuclear Station, Unit 1	FPL	1,150	1,148	North Atlantic Energy Service Corp.	89 06
Total			1,150	1,148		
<b>NEW JERSEY</b>						
Salem	Hope Creek Nuclear Generating Station, Unit 1	FPL	1,031	1,067	Public Service Electric & Gas Co.	86 06
Salem	Salem Nuclear Generating Station, Unit 1	FPL	1,106	1,115	Public Service Electric & Gas Co.	76 12
Salem	Salem Nuclear Generating Station, Unit 2	FPL	1,106	1,115	Public Service Electric & Gas Co.	80 08
Toms River	Oyster Creek Nuclear Power Plant, Unit 1	FPL	610	650	GPU Nuclear Corp.	69 05
Total			3,853	3,947		
<b>NEW YORK</b>						
Buchanan	Indian Point Station, Unit 2	FPL	951	986	Consolidated Edison Co. of New York, Inc.	73 05
Buchanan	Indian Point Station, Unit 3	FPL	965	965	New York Power Authority	76 04
Ontario	Robert Emmett Ginna Nuclear Power Plant, Unit 1	FPL	470	470	Rochester Gas & Electric Corp.	69 11
Scriba	James A. FitzPatrick Nuclear Power Plant	FPL	780	816	New York Power Authority	74 11
Scriba	Nine Mile Point Nuclear Station, Unit 1	FPL	565	625	Niagara Mohawk Power Corp.	69 09
Scriba	Nine Mile Point Nuclear Station, Unit 2	FPL	994	1,062	Niagara Mohawk Power Corp.	87 05
Total			4,725	4,924		
<b>NORTH CAROLINA</b>						
Bonsal	Shearon Harris Nuclear Power Plant, Unit 1	FPL	860	900	Carolina Power & Light Co.	87 01
Cowans Ford Dam	William B. McGuire Nuclear Station, Unit 1	FPL	1,129	1,180	Duke Power Co.	81 08
Cowans Ford Dam	William B. McGuire Nuclear Station, Unit 2	FPL	1,129	1,180	Duke Power Co.	83 05
Southport	Brunswick Steam Electric Plant, Unit 1	FPL	767	821	Carolina Power & Light Co.	76 10
Southport	Brunswick Steam Electric Plant, Unit 2	FPL	754	821	Carolina Power & Light Co.	75 03
Total			4,639	4,902		
<b>OHIO</b>						
Oak Harbor	Davis-Besse Nuclear Power Station, Unit 1	FPL	877	906	Toledo Edison Co.	77 08
Perry	Perry Nuclear Power Plant, Unit 1	FPL	1,166	1,191	Cleveland Electric Illuminating Co.	86 06
Perry	Perry Nuclear Power Plant, Unit 2	CDH		1,205	Cleveland Electric Illuminating Co.	Indef.
Total			2,043	3,302		

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	CAPACITY, NET MW(e)	DESIGN ELECTRICAL RATING, NET MW(e)	LICENSEE	STARTUP
<b>PENNSYLVANIA</b>						
Berwick	Susquehanna Steam Electric Station, Unit 1	FPL	1,040	1,050	Pennsylvania Power & Light Co.	82 09
Berwick	Susquehanna Steam Electric Station, Unit 2	FPL	1,044	1,050	Pennsylvania Power & Light Co.	84 05
Lancaster	Peach Bottom Atomic Power Station, Unit 2	FPL	1,055	1,065	Philadelphia Electric Co.	73 09
Lancaster	Peach Bottom Atomic Power Station, Unit 3	FPL	1,035	1,065	Philadelphia Electric Co.	74 08
Middletown	Three Mile Island Nuclear Station, Unit 1	FPL	786	819	GPU Nuclear Corp.	74 06
Pottstown	Limerick Generating Station, Unit 1	FPL	1,055	1,055	Philadelphia Electric Co.	84 12
Pottstown	Limerick Generating Station, Unit 2	FPL	1,055	1,055	Philadelphia Electric Co.	89 08
Shippingport	Beaver Valley Power Station, Unit 1	FPL	810	835	Duquesne Light Co.	76 05
Shippingport	Beaver Valley Power Station, Unit 2	FPL	820	836	Duquesne Light Co.	87 08
Total			8,700	8,830		
<b>SOUTH CAROLINA</b>						
Hartsville	H.B. Robinson Plant, Unit 2	FPL	683	700	Carolina Power & Light Co.	70 09
Jenkinsville	Virgil C. Summer Nuclear Station, Unit 1	FPL	885	900	South Carolina Electric & Gas Co.	82 10
Lake Wylie	Catawba Nuclear Station, Unit 1	FPL	1,129	1,145	Duke Power Co.	85 01
Lake Wylie	Catawba Nuclear Station, Unit 2	FPL	1,129	1,145	Duke Power Co.	86 05
Seneca	Oconee Nuclear Station, Unit 1	FPL	846	886	Duke Power Co.	73 04
Seneca	Oconee Nuclear Station, Unit 2	FPL	846	886	Duke Power Co.	73 11
Seneca	Oconee Nuclear Station, Unit 3	FPL	846	886	Duke Power Co.	74 09
Total			6,364	6,548		
<b>TENNESSEE</b>						
Daisy	Sequoyah Nuclear Plant, Unit 1	FPL	1,122	1,148	Tennessee Valley Authority	80 07
Daisy	Sequoyah Nuclear Plant, Unit 2	FPL	1,122	1,148	Tennessee Valley Authority	81 11
Spring City	Watts Bar Nuclear Plant, Unit 1	UC		1,165	Tennessee Valley Authority	
Spring City	Watts Bar Nuclear Plant, Unit 2	CDH		1,165	Tennessee Valley Authority	Indef.
Total			2,244	4,626		
<b>TEXAS</b>						
Bay City	South Texas Project, Unit 1	FPL	1,251	1,251	Houston Lighting & Power Co.	88 03
Bay City	South Texas Project, Unit 2	FPL	1,251	1,251	Houston Lighting & Power Co.	89 02
Glen Rose	Comanche Peak Steam Electric Station, Unit 1	FPL	1,150	1,150	Texas Utilities Generating Co.	90 04
Glen Rose	Comanche Peak Steam Electric Station, Unit 2	FPL	1,150	1,150	Texas Utilities Generating Co.	93 08
Total			4,802	4,802		
<b>VERMONT</b>						
Vermont	Vermont Yankee Nuclear Power Station	FPL	504	514	Vermont Yankee Nuclear Power Corp.	72 03
Total			504	514		

TABLE 1 (Continued)

SITE	PLANT NAME	STATUS	CAPACITY, NET MW(e)	DESIGN ELECTRICAL		LICENSEE	STARTUP
				RATING, NET MW(e)			
<b>VIRGINIA</b>							
Gravel Neck	Surry Power Station, Unit 1	FPL	781	788		Virginia Electric & Power Co.	72 07
Gravel Neck	Surry Power Station, Unit 2	FPL	781	788		Virginia Electric & Power Co.	73 03
Mineral	North Anna Power Station, Unit 1	FPL	900	907		Virginia Electric & Power Co.	78 04
Mineral	North Anna Power Station, Unit 2	FPL	887	907		Virginia Electric & Power Co.	80 06
Total			3,349	3,390			
<b>WASHINGTON</b>							
Richland	Washington Nuclear Project, Unit 1	CDH		1,266		Washington Public Power Supply System	Indef.
Richland	Washington Nuclear Project, Unit 2	FPL	1,086	1,100		Washington Public Power Supply System	84 01
Satsop	Washington Nuclear Project, Unit 3	CDH		1,242		Washington Public Power Supply System	Indef.
Total			1,086	3,608			
<b>WISCONSIN</b>							
Carlton	Kewaunee Nuclear Power Plant	FPL	511	535		Wisconsin Public Service Corp.	74 03
Two Creeks	Point Beach Nuclear Plant, Unit 1	FPL	485	497		Wisconsin Electric Power Co.	70 11
Two Creeks	Point Beach Nuclear Plant, Unit 2	FPL	485	497		Wisconsin Electric Power Co.	72 05
Total			1,481	1,529			
U.S. Total			96,713	109,382			

FPL, Full-Power License

UC, Under Active Construction

CDH, Construction Deferred/Halted

SDUR, Shut Down Under Review

**TABLE 2**  
**STATISTICAL SUMMARY OF NUCLEAR REACTORS**  
**AS OF 31 DEC 1993**

	Operable	Being built	Planned	Shutdown	Totals
<b>U.S. REACTORS</b>					
<b>CIVILIAN REACTORS (DOMESTIC)</b>					
Power Reactors					
Central-Station Electric Power Plants	109	7		20	136
Dual-Purpose Plants				1	1
Propulsion (Maritime)				1	1
Experimental Power-Reactor Systems					
Electric-Power Systems	1			23	24
Space Nuclear Auxiliary Power (SNAP)				9	9
Space Propulsion (Rover)				21	21
Test, Research, and University Reactors					
General Irradiation Test	1		1	6	8
High-Power Research and Test	5			7	12
Safety-Research and Test	1			10	11
General Research	14		1	56	71
University Research and Teaching	34		1	31	66
PRODUCTION REACTORS					
Materials Production	1			12	13
Process Development				5	5
MILITARY REACTORS					
Defense Power-Reactor Applications					
Remote Installations				6	6
Propulsion (Naval)	124	15		72	211
Developmental Power					
Electric-Power Experiments and Prototypes				3	3
Propulsion Experiments and Prototypes	5			10	15
Test and Research					
Test				3	3
Research	4			6	10
<b>EXPORT REACTORS</b>					
<b>POWER REACTORS</b>					
Central-Station Electric Power Plants	50	11	4	5	70
Propulsion				1	1
<b>TEST, RESEARCH, AND TEACHING</b>					
General Irradiation Test	7				7
General Research	27	1	1	10	39
University Research and Teaching	19			6	25
Totals	402	34	8	324	768

TABLE 3

## ABBREVIATIONS OF CONTRACTORS, DESIGNERS, SHIPBUILDERS, AND FACILITY OPERATORS

The definitions of the following abbreviations that have been used in this volume contain references to current and historical corporate and government structure.

AC	Allis-Chalmers Mfg. Co.	GA	General Atomics Technologies
ACEC	Ateliers de Construction Électriques de Charleroi S.A. (Belgium)	GD (Quincy)	Quincy Division, General Dynamics Corp.
ACF	ACF Industries, Inc. (reactor activities abandoned by AC)	GE	General Electric Company
AEC	Atomic Energy Commission, a predecessor of the Department of Energy	GNEC	General Nuclear Engineering Corp. (became a division of Combustion Engineering, Inc., in 1964)
AG	Aerojet-General Corporation	IC	Internuclear Co.
AGN	Aerojet-General Nucleonics, formerly a subsidiary and then a division of Aerojet-General Corporation	INC	Idaho Nuclear Corporation
AI	Atomics International, a division of Rockwell International	INEL	Idaho National Engineering Laboratory
Alco	Alco Products, Inc. (reactor activities absorbed by AC)	Ingalls	Ingalls Shipbuilding Corp.
AMF	AMF Atomics, Inc., a division of American Machine & Foundry Co.	Kaman	Kaman Nuclear, a division of Kaman Aircraft Corp.
ANL	Argonne National Laboratory	KAPL	Knolls Atomic Power Laboratory
ANPD	Aircraft Nuclear Propulsion Department, General Electric Company (name changed to Flight Propulsion Laboratory Department)	KE	Kaiser Engineers, a division of Henry J. Kaiser Co.
AR	American Radiator	LANL	Los Alamos National Laboratory
AS Inc.	American Standard Inc.	LLNL	Lawrence Livermore National Laboratory
AU	Associated Universities, Inc. (Brookhaven National Laboratory)	Lockheed	Lockheed Aircraft Corp.
BAC	Bendix Aviation Corp.	Mare Island	Mare Island Naval Shipyard
Bethlehem	Shipbuilding Division, Bethlehem Steel Co. (now Quincy Division, General Dynamics Corp.)	Martin	Martin Marietta Corp.
Betis	Betis Atomic Power Laboratory	Maxon	Maxon Construction Co.
Blaw-Knox	Blaw-Knox Co.	Met. Lab	Metallurgical Laboratory of the Manhattan Engineer District
B&R	Burns & Roe, Inc.	NASA	National Aeronautics and Space Administration
B&W	Babcock & Wilcox Co.	NBS	National Bureau of Standards
BNL	Brookhaven National Laboratory	Newport News	Newport News Shipbuilding & Dry Dock Co.
CL	Clinton Laboratory of the Manhattan Engineer District	NRDS	Nuclear Rocket Development Station
Comb.	Combustion Engineering, Inc.	NRL	Naval Research Laboratory
Convair	Convair Division, General Dynamics Corp.	NSA	Nuclear Systems Associates
Cook	Nucleidyne Co., a division of Cook Electric Company	NTS	Nevada Test Site
CW	Curtiss-Wright Corporation	NYSC	New York Shipbuilding Corp.
Daystrom	Daystrom, Inc.	ORNL	Oak Ridge National Laboratory
DNA	Defense Nuclear Agency, Department of Defense	PNL	Pacific Northwest Laboratory
DOD	Department of Defense	Portsmouth	Portsmouth Naval Shipyard
DOE	Department of Energy	PPC	Phillips Petroleum Co.
Du Pont	E.I. Du Pont de Nemours & Company, Inc.	PRDC	Power Reactor Development Company
EG&G ID	EG&G Idaho, Inc. (a division of EG&G, Inc.)	RI	Rockwell International
Electric Boat	Electric Boat Division, General Dynamics Corp.	Sandia	Sandia National Laboratories
Fluor	The Fluor Corporation, Ltd.	UNC	United Nuclear Corporation, Development Division
Fram.	Framatome	Viro	Vitro Corporation of America
FW	Foster Wheeler Corp.	West.	Westinghouse Electric Corporation
		WHC	Westinghouse Hanford Co.

**REACTORS AND FACILITIES OPERABLE,  
BEING BUILT, OR PLANNED**



# REACTORS AND FACILITIES OPERABLE, BEING BUILT, OR PLANNED

## 1. POWER REACTORS

### A. Central-Station Electric Power Plants

## PART I CIVILIAN REACTORS (DOMESTIC)

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power Licensed MW(t)	Initial criticality (yr mo)	Comment
<b>OPERABLE</b>							
Alvin W. Vogtle Nuclear Plant, Unit 1 (Georgia Power Co.) [50-424]	Waynesboro, GA	West.	Pressurized water	1158.0	3565.0	87 03	
Alvin W. Vogtle Nuclear Plant, Unit 2 (Georgia Power Co.) [50-425]	Waynesboro, GA	West.	Pressurized water	1157.0	3565.0	89 03	
Arkansas Nuclear One, Unit 1 (Energy Operations Inc.) [50-313]	Russellville, AR	B&W	Pressurized water	836.0	2568.0	74 08	
Arkansas Nuclear One, Unit 2 (Energy Operations Inc.) [50-368]	Russellville, AR	Comb.	Pressurized water	858.0	2815.0	78 12	
Bever Valley Power Station, Unit 1 (Duquesne Light Co., Ohio Edison Co.) [50-334]	Shippingport, PA	West.	Pressurized water	810.0	2652.0	76 05	
Bever Valley Power Station, Unit 2 (Duquesne Light Co.) [50-412]	Shippingport, PA	West.	Pressurized water	820.0	2652.0	87 08	
Big Rock Point Nuclear Plant (Consumers Power Co.) [50-155]	Big Rock Point, MI	GE	Boiling water	67.0	240.0	62 09	
Braidwood Station, Unit 1 (Commonwealth Edison Co.) [50-456]	Braidwood, IL	West.	Pressurized water	1120.0	3411.0	87 05	
Braidwood Station, Unit 2 (Commonwealth Edison Co.) [50-457]	Braidwood, IL	West.	Pressurized water	1120.0	3411.0	88 03	
Browns Ferry Nuclear Power Station, Unit 1 (Tennessee Valley Authority) [50-259]	Decatur, AL	GE	Boiling water	0.0	3293.0	73 08	Maximum dependable capacity is zero. Administrative hold to resolve various TVA and NRC concerns 6/1/85.
Browns Ferry Nuclear Power Station, Unit 2 (Tennessee Valley Authority) [50-260]	Decatur, AL	GE	Boiling water	1065.0	3293.0	74 07	Restarted 5/23/91.
Browns Ferry Nuclear Power Station, Unit 3 (Tennessee Valley Authority) [50-296]	Decatur, AL	GE	Boiling water	0.0	3293.0	76 08	Maximum dependable capacity is zero. Administrative hold to resolve various TVA and NRC concerns 3/3/85.
Brunswick Steam Electric Plant, Unit 1 (Carolina Power & Light Co.) [50-325]	Southport, NC	GE	Boiling water	767.0	2436.0	76 10	
Brunswick Steam Electric Plant, Unit 2 (Carolina Power & Light Co.) [50-324]	Southport, NC	GE	Boiling water	754.0	2436.0	75 03	
Byron Station, Unit 1 (Commonwealth Edison Co.) [50-454]	Byron, IL	West.	Pressurized water	1105.0	3411.0	85 02	
Byron Station, Unit 2 (Commonwealth Edison Co.) [50-455]	Byron, IL	West.	Pressurized water	1105.0	3411.0	87 01	
Callaway Plant, Unit 1 (Union Electric Co.) [50-483]	Fulton, MO	West.	Pressurized water	1120.0	3565.0	84 10	
Calvert Cliffs Nuclear Power Plant, Unit 1 (Baltimore Gas & Electric Co.) [50-317]	Lusby, MD	Comb.	Pressurized water	830.0	2700.0	74 10	
Calvert Cliffs Nuclear Power Plant, Unit 2 (Baltimore Gas & Electric Co.) [50-318]	Lusby, MD	Comb.	Pressurized water	830.0	2700.0	76 11	
Caibahwa Nuclear Station, Unit 1 (Duke Power Co.) [50-413]	Lake Wylie, SC	West.	Pressurized water	1129.0	3411.0	85 01	

## 1. POWER REACTORS

## PART I CIVILIAN REACTORS (DOMESTIC)

### A. Central-Station Electric Power Plants (Continued)

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Licensed MW(t)	Initial criticality (yr mo)	Comment
<b>OPERABLE (Continued)</b>							
Catawba Nuclear Station, Unit 2 (Duke Power Co.) [50-414]	Lake Wylie, SC	West.	Pressurized water	1129.0	3411.0	86 05	
Clinton Power Station, Unit 1 (Illinois Power Co.) [50-461]	Clinton, IL	GE	Boiling water	930.0	2894.0	87 02	
Comanche Peak Steam Electric Station, Unit 1 (Texas Utilities Generating Co.) [50-445]	Glen Rose, TX	West.	Pressurized water	1150.0	3411.0	90 04	
Comanche Peak Steam Electric Station, Unit 2 (Texas Utilities Generating Co.) [50-446]	Glen Rose, TX	West.	Pressurized water	1150.0	3411.0	93 08	Commercial operation, 8/3/93.
Cooper Nuclear Station (Nebraska Public Power District) [50-298]	Brownville, NE	GE	Boiling water	764.0	2381.0	74 02	
Crystal River Nuclear Plant, Unit 3 (Florida Power Corp.) [50-302]	Red Level, FL	B&W	Pressurized water	821.0	2544.0	77 01	
Davis-Besse Nuclear Power Station, Unit 1 (Toledo Edison Co.) [50-346]	Oak Harbor, OH	B&W	Pressurized water	877.0	2772.0	77 08	
Diablo Canyon Nuclear Power Plant, Unit 1 (Pacific Gas & Electric Co.) [50-275]	Diablo Canyon, CA	West.	Pressurized water	1073.0	3338.0	84 04	
Diablo Canyon Nuclear Power Plant, Unit 2 (Pacific Gas & Electric Co.) [50-323]	Diablo Canyon, CA	West.	Pressurized water	1087.0	3411.0	85 08	
Donald C. Cook Nuclear Power Plant, Unit 1 (Indiana and Michigan Electric Co.) [50-315]	Bridgman, MI	West.	Pressurized water	1000.0	3250.0	75 01	
Donald C. Cook Nuclear Power Plant, Unit 2 (Indiana and Michigan Electric Co.) [50-316]	Bridgman, MI	West.	Pressurized water	1060.0	3411.0	78 03	
Dresden Nuclear Power Station, Unit 2 (Commonwealth Edison Co.) [50-237]	Morris, IL	GE	Boiling water	772.0	2527.0	70 01	
Dresden Nuclear Power Station, Unit 3 (Commonwealth Edison Co.) [50-249]	Morris, IL	GE	Boiling water	773.0	2527.0	71 01	
Duane Arnold Energy Center, Unit 1 (Iowa Electric Light & Power Co.) [50-331]	Palo, IA	GE	Boiling water	515.0	1658.0	74 03	
Edwin L. Hatch Nuclear Plant, Unit 1 (Georgia Power Co.) [50-321]	Baxley, GA	GE	Boiling water	737.0	2436.0	74 09	
Edwin L. Hatch Nuclear Plant, Unit 2 (Georgia Power Co.) [50-366]	Baxley, GA	GE	Boiling water	757.0	2436.0	78 07	
Enrico Fermi Atomic Power Plant, Unit 2 (Detroit Edison Co.) [50-341]	Newport, MI	GE	Boiling water	1085.0	3430.0	85 06	
Fort Calhoun Station, Unit 1 (Omaha Public Power District) [50-285]	Fort Calhoun, NE	Comb.	Pressurized water	478.0	1500.0	73 08	
Grand Gulf Nuclear Station, Unit 1 (Energy Operations Inc.) [50-416]	Port Gibson, MS	GE	Boiling water	1143.0	3833.0	82 08	
H.B. Robinson Plant, Unit 2 (Carolina Power & Light Co.) [50-261]	Harrisville, SC	West.	Pressurized water	683.0	2300.0	70 09	
Haddam Neck Plant (Connecticut Yankee Atomic Power Co.) [50-213]	Haddam Neck, CT	West.	Pressurized water	560.0	1825.0	67 07	
Hope Creek Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co.) [50-354]	Salem, NJ	GE	Boiling water	1031.0	3293.0	86 06	
Indian Point Station, Unit 2 (Consolidated Edison Co. of New York, Inc.) [50-247]	Buchanan, NY	West.	Pressurized water	951.0	3071.0	73 05	

Indian Point Station, Unit 3 (New York Power Authority) [50-286]	Buchanan, NY	West.	Pressurized water	965.0	3025.0	76 04
James A. FitzPatrick Nuclear Power Plant (New York Power Authority) [50-333]	Scriba, NY	GE	Boiling water	780.0	2436.0	74 11
Joseph M. Farley Nuclear Plant, Unit 1 (Southern Nuclear Operating Co.) [50-348]	Dothan, AL	West.	Pressurized water	812.0	2652.0	77 08
Joseph M. Farley Nuclear Plant, Unit 2 (Southern Nuclear Operating Co.) [50-364]	Dothan, AL	West.	Pressurized water	822.0	2652.0	81 05
Keweenaw Nuclear Power Plant (Wisconsin Public Service Corp.) [50-305]	Carlton, WI	West.	Pressurized water	511.0	1650.0	74 03
La Salle County Station, Unit 1 (Commonwealth Edison Co.) [50-373]	Seneca, IL	GE	Boiling water	1036.0	3323.0	82 06
La Salle County Station, Unit 2 (Commonwealth Edison Co.) [50-374]	Seneca, IL	GE	Boiling water	1036.0	3323.0	84 03
Limerick Generating Station, Unit 1 (Philadelphia Electric Co.) [50-352]	Pottstown, PA	GE	Boiling water	1055.0	3293.0	84 12
Limerick Generating Station, Unit 2 (Philadelphia Electric Co.) [50-353]	Pottstown, PA	GE	Boiling water	1055.0	3293.0	89 08
Maine Yankee Atomic Power Plant (Maine Yankee Atomic Power Co.) [50-309]	Wisasset, ME	Comb.	Pressurized water	860.0	2700.0	72 10
Millstone Nuclear Power Station, Unit 1 (Northeast Nuclear Energy Co.) [50-245]	Waterford, CT	GE	Boiling water	641.0	2011.0	70 10
Millstone Nuclear Power Station, Unit 2 (Northeast Nuclear Energy Co.) [50-336]	Waterford, CT	Comb.	Pressurized water	873.0	2700.0	75 10
Millstone Nuclear Power Station, Unit 3 (Northeast Nuclear Energy Co.) [50-423]	Waterford, CT	West.	Pressurized water	1137.0	3411.0	86 01
Monticello Nuclear Generating Plant (Northern States Power Co.) [50-263]	Monticello, MN	GE	Boiling water	536.0	1670.0	70 12
Nine Mile Point Nuclear Station, Unit 1 (Niagara Mohawk Power Corp.) [50-220]	Scriba, NY	GE	Boiling water	565.0	1850.0	69 09
Nine Mile Point Nuclear Station, Unit 2 (Niagara Mohawk Power Corp.) [50-410]	Scriba, NY	GE	Boiling water	994.0	3323.0	87 05
North Anna Power Station, Unit 1 (Virginia Electric & Power Co.) [50-338]	Mineral, VA	West.	Pressurized water	900.0	2893.0	78 04
North Anna Power Station, Unit 2 (Virginia Electric & Power Co.) [50-339]	Mineral, VA	West.	Pressurized water	887.0	2893.0	80 06
Oconee Nuclear Station, Unit 1 (Duke Power Co.) [50-269]	Seneca, SC	B&W	Pressurized water	846.0	2568.0	73 04
Oconee Nuclear Station, Unit 2 (Duke Power Co.) [50-270]	Seneca, SC	B&W	Pressurized water	846.0	2568.0	73 11
Oconee Nuclear Station, Unit 3 (Duke Power Co.) [50-287]	Seneca, SC	GE	Boiling water	610.0	1930.0	69 05
Oyster Creek Nuclear Power Plant, Unit 1 (GPU Nuclear Corp.) [50-219]	Toms River, NJ	GE	Boiling water	730.0	2530.0	71 05
Palisades Nuclear Plant, Unit 1 (Consumers Power Co.) [50-255]	South Haven, MI	Comb.	Pressurized water	1221.0	3800.0	85 05
Palo Verde Nuclear Generating Station, Unit 1 (Arizona Public Service Co.) [50-528]	Wintersburg, AZ	Comb.	Pressurized water	1221.0	3800.0	86 04
Palo Verde Nuclear Generating Station, Unit 2 (Arizona Public Service Co.) [50-529]	Wintersburg, AZ	Comb.	Pressurized water	1304.0	3817.0	87 10
Palo Verde Nuclear Generating Station, Unit 3 (Arizona Public Service Co.) [50-530]	Wintersburg, AZ	Comb.	Pressurized water	1055.0	3293.0	73 09
Peach Bottom Atomic Power Station, Unit 2 (Philadelphia Electric Co.) [50-277]	Lancaster, PA	GE	Boiling water	1035.0	3293.0	74 08
Peach Bottom Atomic Power Station, Unit 3 (Philadelphia Electric Co.) [50-278]	Lancaster, PA	GE	Boiling water	1035.0	3293.0	

## 1. POWER REACTORS

## PART I CIVILIAN REACTORS (DOMESTIC)

### A. Central-Station Electric Power Plants (Continued)

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Licensed MW(t)	Power MD capacity net MW(e)	Initial criticality (yr mo)	Comment
OPERABLE (Continued)								
Perry Nuclear Power Plant, Unit 1 (Cleveland Electric Illuminating Co.) [50-440]	Perry, OH	GE	Boiling water	1166.0	3579.0	86 06		
Pilgrim Nuclear Power Station, Unit 1 (Boston Edison Co.) [50-293]	Plymouth, MA	GE	Boiling water	670.0	1998.0	72 06		
Point Beach Nuclear Plant, Unit 1 (Wisconsin Electric Power Co.) [50-266]	Two Creeks, WI	West.	Pressurized water	485.0	1519.0	70 11		
Point Beach Nuclear Plant, Unit 2 (Wisconsin Electric Power Co.) [50-301]	Two Creeks, WI	West.	Pressurized water	485.0	1519.0	72 05		
Prarie Island Nuclear Generating Plant, Unit 1 (Northern States Power Co.) [50-282]	Red Wing, MN	West.	Pressurized water	513.0	1650.0	73 12		
Prairie Island Nuclear Generating Plant, Unit 2 (Northern States Power Co.) [50-306]	Red Wing, MN	West.	Pressurized water	512.0	1650.0	74 12		
Quad-Cities Station, Unit 1 (Commonwealth Edison Co.) [50-254]	Cordova, IL	GE	Boiling water	769.0	2511.0	71 10		
Quad-Cities Station, Unit 2 (Commonwealth Edison Co.) [50-265]	Cordova, IL	GE	Boiling water	769.0	2511.0	72 04		
River Bend Station, Unit 1 (Gulf States Utilities Co.) [50-458]	St. Francisville, LA	GE	Boiling water	936.0	2894.0	85 10		
Robert Emmett Gianna Nuclear Power Plant, Unit 1 (Rochester Gas & Electric Corp.) [50-244]	Ontario, NY	West.	Pressurized water	470.0	1520.0	69 11		
Salem Nuclear Generating Station, Unit 1 (Public Service Electric & Gas Co.) [50-272]	Salem, NJ	West.	Pressurized water	1106.0	3411.0	76 12		
Salem Nuclear Generating Station, Unit 2 (Public Service Electric & Gas Co.) [50-311]	Salem, NJ	West.	Pressurized water	1106.0	3411.0	80 08		
San Onofre Nuclear Generating Station, Unit 2 (Southern California Edison) [50-361]	San Clemente, CA	Comb.	Pressurized water	1070.0	3390.0	82 07		
San Onofre Nuclear Generating Station, Unit 3 (Southern California Edison) [50-362]	San Clemente, CA	Comb.	Pressurized water	1080.0	3390.0	83 08		
Seabrook Nuclear Station, Unit 1 (North Atlantic Energy Service Corp.) [50-443]	Seabrook, NH	West.	Pressurized water	1150.0	3411.0	89 06		
Sequoyah Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-327]	Daisy, TN	West.	Pressurized water	1122.0	3411.0	80 07		
Sequoyah Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-328]	Daisy, TN	West.	Pressurized water	1122.0	3411.0	81 11		
Shearon Harris Nuclear Power Plant, Unit 1 (Carolina Power & Light Co.) [50-400]	Bonsal, NC	West.	Pressurized water	860.0	2775.0	87 01		
South Texas Project, Unit 1 (Houston Lighting & Power Co.) [50-498]	Bay City, TX	West.	Pressurized water	1251.0	3800.0	88 03		
South Texas Project, Unit 2 (Houston Lighting & Power Co.) [50-499]	Bay City, TX	West.	Pressurized water	1251.0	3800.0	89 02		
St. Lucie Plant, Unit 1 (Florida Power & Light Co.) [50-335]	Fort Pierce, FL	Comb.	Presurized water	839.0	2700.0	76 04		
St. Lucie Plant, Unit 2 (Florida Power & Light Co.) [50-389]	Fort Pierce, FL	Comb.	Presurized water	839.0	2700.0	83 06		

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Design, electrical power net MW(e)	Estimated initial power net MW(t)	Initial criticality (yr mo)	Comment
BEING BUILT							
Bellefonte Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-438]	Scottsboro, AL	B&W	Pressurized water	1235.0	3760.0	Indef.	
Bellefonte Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-439]	Scottsboro, AL	B&W	Pressurized water	1235.0	3760.0	Indef.	
Perry Nuclear Power Plant, Unit 2 (Cleveland Electric Illuminating Co.) [50-441]	Perry, OH	GE	Boiling water	1205.0	3759.0	Indef.	
Washington Nuclear Project, Unit 1 (Washington Public Power Supply System) [50-460]	Richland, WA	B&W	Pressurized water	1266.0	3760.0	Indef.	
Washington Nuclear Project, Unit 3 (Washington Public Power Supply System) [50-508]	Satsop, WA	Comb.	Pressurized water	1242.0	3800.0	Indef.	
Watts Bar Nuclear Plant, Unit 1 (Tennessee Valley Authority) [50-390]	Spring City, TN	West.	Pressurized water	1165.0	3411.0	No official date has been established by the TVA.	
Watts Bar Nuclear Plant, Unit 2 (Tennessee Valley Authority) [50-391]	Spring City, TN	West.	Pressurized water	1165.0	3411.0	Indef.	
Surry Power Station, Unit 1 (Virginia Electric & Power Co.) [50-280]	Gravel Neck, VA	West.	Pressurized water	781.0	2441.0	72.07	
Surry Power Station, Unit 2 (Virginia Electric & Power Co.) [50-281]	Gravel Neck, VA	West.	Pressurized water	781.0	2441.0	73.03	
Susquehanna Steam Electric Station, Unit 1 (Pennsylvania Power & Light Co.) [50-387]	Berwick, PA	GE	Boiling water	1040.0	3293.0	82.09	
Susquehanna Steam Electric Station, Unit 2 (Pennsylvania Power & Light Co.) [50-388]	Berwick, PA	GE	Boiling water	1044.0	3293.0	84.05	
Three Mile Island Nuclear Station, Unit 1 (GPU Nuclear Corp.) [50-289]	Middletown, PA	B&W	Pressurized water	786.0	2568.0	74.06	
Turkey Point Plant, Unit 3 (Florida Power & Light Co.) [50-250]	Florida City, FL	West.	Pressurized water	666.0	2200.0	72.10	
Turkey Point Plant, Unit 4 (Florida Power & Light Co.) [50-251]	Florida City, FL	West.	Pressurized water	666.0	2200.0	73.06	
Vermont Yankee Nuclear Power Station (Vermont Yankee Nuclear Power Corp.) [50-271]	Vermont, VT	GE	Boiling water	504.0	1593.0	72.03	
Virgil C. Summer Nuclear Station, Unit 1 (South Carolina Electric & Gas Co.) [50-395]	Jenkinsville, SC	West.	Pressurized water	885.0	2775.0	82.10	
Washington Nuclear Project, Unit 2 (Washington Public Power Supply System) [50-397]	Richland, WA	GE	Boiling water	1086.0	3323.0	84.01	
Waterford Generating Station, Unit 3 (Entergy Operations Inc.) [50-382]	Taft, LA	Comb.	Pressurized water	1075.0	3390.0	85.03	
William B. McGuire Nuclear Station, Unit 1 (Duke Power Co.) [50-369]	Cowans Ford Dam, NC	West.	Pressurized water	1129.0	3411.0	81.08	
William B. McGuire Nuclear Station, Unit 2 (Duke Power Co.) [50-370]	Cowans Ford Dam, NC	West.	Pressurized water	1129.0	3411.0	83.05	
Wolf Creek Generating Station (Wolf Creek Nuclear Operating Corp.) [50-482]	Burlington, KS	West.	Pressurized water	1134.0	3565.0	85.05	
Zion Nuclear Plant, Unit 1 (Commonwealth Edison Co.) [50-295]	Zion, IL	West.	Pressurized water	1040.0	3250.0	73.06	
Zion Nuclear Plant, Unit 2 (Commonwealth Edison Co.) [50-304]	Zion, IL	West.	Pressurized water	1040.0	3250.0	73.12	

## 1. POWER REACTORS

## PART I CIVILIAN REACTORS (DOMESTIC)

### B. Dual-Purpose Plants

(No reactors currently in this category)

### C. Propulsion (Maritime)

(No reactors currently in this category)

## 2. EXPERIMENTAL POWER-REACTOR SYSTEMS

### A. Electric-Power Systems

Name (Regulatory agency) Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Design Type. Principal nucl. contr.	Comment
<b>OPERABLE</b>								
Experimental Breeder Reactor II (DOE), INEL Site, ID	20,000.0	62,500.0			61.00	EBR-II. Sodium cooled, fast. ANL		The EBR-II reactor is a major irradiation facility for the LMR program; it continues to generate electric power for INEL grid. Tests at EBR-II simulating LOF and LOHS accidents demonstrated that the pool- type design using metallic fuel will safely shut itself down without automatic protection system or operator action. Advanced metal alloy fuel subassemblies have achieved burnups in excess of 180,000 Mwd/t.

### B. Space Nuclear Auxiliary Power (SNAP)

(No reactors currently in this category)

### C. Space Propulsion

(No reactors currently in this category)

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

#### A. General Irradiation Test

Name (Regulatory agency).	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(T)	Initial criticality (yr mo)	Desig. Type. Principal nucl. contr.	Comment
OPERABLE Advanced Test Reactor (DOE). INEL, ID	250,000.0				68 00	ATR. Tank. EG&G-ID	Operating.	

#### PLANNED

Los Alamos National Laboratory (DOE).  
Los Alamos, NM

#### B. High-Power Research and Test

OPERABLE	Brookhaven High Flux Beam Research Reactor (DOE). Upton, NY	35,400.0	HFBR. Heavy water. BNL	65 00	Power derated subject to further safety tests.
	Brookhaven Medical Research Reactor (DOE). Upton, NY	3,000.0	BMRR. Tank.	59 00	
	High Flux Isotope Reactor (DOE). Oak Ridge, TN	85,000.0	Daystrom HFIR. Tank flux trap. ORNL	65 00	Operating.
	National Institute of Standards & Technology (NRC). Gaithersburg, MD	20,000.0	NIST. Heavy water.	67 00	
	Omega West Reactor (DOE). Los Alamos, NM	8,000.0	NBS-B&R OWR. Tank. LANL	56 00	Potential candidate for a U.S. Mo-99 production effort.

#### C. Safety Research and Test

OPERABLE	Transient Reactor Test (DOE). INEL Site, ID	59 00	TREAT. Graphite. ANL	Authorized power, n.a. Transient RX.
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### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### D. General Research

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Desig. Type. Principal nucl. contr.	Comment
<b>OPERABLE</b>								
Advanced Reactivity Measurement Facility (DOE). INEL Site, ID Aerostat Operations, Inc. (NRC). San Ramon, CA	100.0 250.0			60.00 65.00	ARMF. Pool. EG&G-ID AGNR. Pool-TRIGA			Fast and thermal neutron irradiations and reactivity measurements. Reactor currently shut down.
Coupled Fast Reactivity Measurement Facility (DOE). INEL Site, ID Dow Chemical Co. (NRC). Midland, MI	100.0 300.0			68.00 67.00	CERMF. Pool. EG&G-ID core. GA			Fast and thermal neutron irradiations, neutron radiography, and thermal and fast fissile assay. Reactor currently shut down.
General Atomics, Advanced TRIGA-Mk F Prototype Reactor (NRC). La Jolla, CA	1,500.0			60.00	TRIGA-Mk I. U-Zr hydride. GA			
General Atomics, TRIGA-Mk I Prototype Reactor (NRC). La Jolla, CA	250.0			58.00	TRIGA-Mk I. U-ZR hydride. Owner			
General Electric Nuclear Test Reactor (NRC). Pleasanton, CA Neutron Radiography Facility (DOE). INEL, ID	100.0 250.0			57.00 77.00	NTR-LWR. GE NRAD. Pool-TRIGA			
Omaha Veterans Administration Hospital (NRC). Omaha, NE	18.0			59.00	core. ANL TRIGA-Mk I. U-Zr hydride. GA			
Rhode Island Nuclear Science Center (NRC). Narragansett, RI Sandia Pulsed Reactor II (DOE). Kirtland AFB, East, NM	2,000.0 25.0			64.00 67.00	RINSC. Pool. RI SPR-II. Bare metal fast			
Sandia Pulsed Reactor III (DOE). Kirtland AFB, East, NM	25.0			75.00	burst. Sandia SPR-III. Bare metal fast			
SNL Annular Core Research Reactor (DOE). Kirtland AFB, East, NM U.S. Geological Survey Laboratory (Department of the Interior) (NRC). Denver, CO	2,000.0 1,000.0			78.00 69.00	ACRR. Pool-UO <sub>2</sub> BeO core. Sandia TRIGA-Mk I. U-Zr hydride. GA			
<b>PLANNED</b>								
Advanced Neutron Source Reactor (DOE). Oak Ridge, TN	330,000.0							
ANS. D <sub>2</sub> O flux trap. ORNL								
								Advanced conceptual design. In preparation for FY 1995 line item start.

## E. University Research and Teaching

	Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Power licensed MW(t)	Initial criticality (yr mo)	Desig. Type. Principal nuc. contr.	Comment
<b>OPERABLE</b>										
Arizona, University of (NRC). Tucson, AZ		100.0				58 00	TRIGA-Mk I. U-Zr hydride. GA			
California, Irvine, University of (NRC). Irvine, CA		250.0				69 00	TRIGA-Mk I. U-Zr hydride. GA			
Cornell University (NRC). Ithaca, NY		500.0				62 00	TRIGA-Mk II. U-Zr hydride. GA			
Cornell University Zero Power Reactor (NRC). Ithaca, NY		100.0				62 00	ZPR. Tank. Vitro			Authorized power is negligible.
Florida, University of (NRC). Gainesville, FL						59 00	UFTR. Graphite/water. GNEC			
Georgia Institute of Technology (NRC). Atlanta, GA		5,000.0				64 00	GTRR. Heavy water. GNEC			
Idaho State University (NRC). Pocatello, ID						67 00	AGN-201P-103. Homog. solid. AGN			The AGN-201P-103 was operated at San Ramon, CA, by Aerojet-General Corporation from 1957 to 1966. In 4/67 Idaho State University applied for a license to operate the reactor at Pocatello, ID. Authorized power is negligible.
Illinois, University of (NRC). Urbana, IL		10.0				71 00	LOPRA. U-Zr hydride. GA			
Illinois, University of (NRC). Champaign-Urbana, IL		1,500.0				60 00	TRIGA-Mk II. U-Zr hydride. GA			
Iowa State University (NRC). Ames, IA		10.0				59 00	UTR-10. Graphite/water. AS Inc.			
Kansas State University (NRC). Manhattan, KS		250.0				62 00	TRIGA-Mk II. U-Zr hydride. GA			
Manhattan College (NRC). New York, NY						64 00	MCZPR. Tank. AMF			
Maryland, University of (NRC). College Park, MD		250.0				74 00	TRIGA. Tank-TRIGA			
Massachusetts, University of (NRC). Lowell, MA		1,000.0				74 00	core. GA ULR. Pool. GE			
Massachusetts Institute of Technology (NRC). Cambridge, MA		5,000.0				58 00	MITR-II. Heavy-water reflected. ACF			
Michigan, University of (Ford Nuclear Reactor) (NRC). Ann Arbor, MI		2,000.0				57 00	FNR. Pool. B&W			
Missouri at Rolla, University of (NRC). Rolla, MO		200.0				61 00	UMR-R. Pool. CW			
Missouri, University of (NRC). Columbia, MO		10,000.0				66 00	MURR. Tank. Owner-IC			

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### E. University Research and Teaching (Continued)

Name (Regulatory agency) Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	MD capacity net MW(e)	Power licensed MW(T)	Initial criticality (yr mo)	Desig. Type. Principal nucl. contr.	Comment
<b>OPERABLE (Continued)</b>								
New Mexico, University of (NRC). Albuquerque, NM								
North Carolina State University (NRC). Raleigh, NC	1,000.0							
Ohio State University (NRC). Columbus, OH	500.0							
Oregon State University (NRC). Corvallis, OR	1,000.0							
Penn State TRIGA Reactor (NRC). University Park, PA	1,000.0							
Purdue University (NRC). West Lafayette, IN	1.0							
Reed College (NRC). Portland, OR	250.0							
State University of New York (NRC). Buffalo, NY	2,000.0							
Texas A&M University (NRC). College Station, TX	1,000.0							
Texas A&M University (NRC). College Station, TX	1,100.0							
Utah, University of (NRC). Salt Lake City, UT	250.0							
Virginia, University of (NRC). Charlottesville, VA	2,000.0							
North Carolina State University (NRC). Raleigh, NC	72.00							
Ohio State University (NRC). Columbus, OH	61.00							
Oregon State University (NRC). Corvallis, OR	67.00							
Penn State TRIGA Reactor (NRC). University Park, PA	65.00							
Purdue University (NRC). West Lafayette, IN	62.00							
Reed College (NRC). Portland, OR	68.00							
State University of New York (NRC). Buffalo, NY	61.00							
Texas A&M University (NRC). College Station, TX	57.00							
Texas A&M University (NRC). College Station, TX	61.00							
Texas A&M University (NRC). Austin, TX	89.00							
Utah, University of (NRC). Salt Lake City, UT	75.00							
Virginia, University of (NRC). Charlottesville, VA	60.00							
North Carolina State University (NRC). Raleigh, NC	AGN-201M-112. Homog. Solid. AGN							
Ohio State University (NRC). Columbus, OH	PULSTAR. Pool. AMF OSURR. Pool.							
Oregon State University (NRC). Corvallis, OR	Lockheed OSTR. U-Zr hydride. GA							
Penn State TRIGA Reactor (NRC). University Park, PA	PSTR. Pool-TRIGA core. GA							
Purdue University (NRC). West Lafayette, IN	PUR-1. Pool. Lockheed TRIGA-Mk I. U-Zr hydride. GA							
Reed College (NRC). Portland, OR	PULSTAR. Pool. AMF AGN-201M-106. Homog. solid. AGN							
State University of New York (NRC). Buffalo, NY	TRIGA. U-Zr hydride. GA							
Texas A&M University (NRC). College Station, TX	The Nuclear Science Center Reactor at Texas A&M University has been modified for 1000-kW steady-state operation with a TRIGA-type core. Power level was 100 kW prior to modification in 1968.							
Texas A&M University (NRC). Austin, TX	TRIGA-Mk II. U-Zr hydride. GA							
Utah, University of (NRC). Salt Lake City, UT	TRIGA-Mk I. U-Zr hydride. GA							
Virginia, University of (NRC). Charlottesville, VA	UVAR. Pool. Owner-B&W							

Washington State University (NRC). Pullman, WA	1,000.0	WSTR. Pool-TRIGA core. GA	In 1967 the original MTR-type core of the Washington State University reactor was replaced by a modified TRIGA-type core and control system, and the steady-state power level was increased from 100 to 1000 kW(t).
Wisconsin, University of (NRC). Madison, WI	1,000.0	TRIGA. Pool-TRIGA core. GA	The University of Wisconsin reactor has been modified for 1000-kW steady-state operation with a TRIGA-type core. Power level was 250 kW prior to modification in 1967.
Worcester Polytechnic Institute (NRC). Worcester, MA	10.0	No Desg. Pool. GE	
PLANNED	2500	TRIGA-Mk I. U-Zr hydride. GA	
Arkansas Tech University (NRC). Russellville, AR		The Arkansas Tech University reactor contains parts from the TRIGA reactor dismantled at Michigan State University.	

## 1. MATERIALS PRODUCTION

## PART II PRODUCTION REACTORS

Name (Owner)	Location	Nuclear designer	Type	Authorized power	Startup	Comment
OPERABLE K Reactor (DOE)	Aiken, SC	Du Pont	Heavy water	54 00		Cold standby.

## 2. PROCESS DEVELOPMENT

(No reactors currently in this category)

## 1. DEFENSE POWER-REACTOR APPLICATIONS

## PART III MILITARY REACTORS

### A. Remote Installations

(No reactors currently in this category)

### B. Propulsion (Naval)

The abbreviations used here are defined as follows:

SSN, Submarine (Nuclear Propulsion)  
 SSBN, Fleet Ballistic Missile Submarine (Nuclear Propulsion)  
 CGN, Guided Missile Cruiser (Nuclear Propulsion)  
 CVN, Aircraft Carrier (Nuclear Propulsion)

Name (all owned by U.S. Navy)	Designation	Shipbuilder	Startup	Comment
<b>OPERABLE</b>				
USS GATO	SSN615	GD (Quincy)	67 00	
DANIEL WEBSTER	ex-SSBN626	Electric Boat (Groton)	64 00	
USS STONEWALL JACKSON	SSBN634	Mare Island	64 00	
SAM RAYBURN	ex-SSBN635	Newport News	64 00	
USS STURGEON	SSN637	Electric Boat (Groton)	66 00	
USS WHALE	SSN638	GD (Quincy)	68 00	
USS TAUTOG	SSN639	Ingalls	68 00	
USS SIMON BOLIVAR	SSBN641	Newport News	65 00	
USS KAMEHAMEHA	SSN642	Mare Island	65 00	
USS JAMES K. POLK	SSN645	Electric Boat (Groton)	66 00	
USS GRAYLING	SSN646	Portsmouth	69 00	
USS POGY	SSN647	NYSC/Ingalls	70 00	
USS ASPRO	SSN648	Ingalls	68 00	
USS SUNFISH	SSN649	GD (Quincy)	68 00	
USS PARGO	SSN650	Electric Boat (Groton)	67 00	
USS PUFFER	SSN652	Ingalls	69 00	
USS MARIANO G. VALLEJO	SSBN658	Mare Island	66 00	
USS SAND LANCE	SSN660	Portsmouth	71 00	
USS GURNARD	SSN662	Mare Island	68 00	
USS HAMMERHEAD	SSN663	Newport News	67 00	
USS HAWKBILL	SSN666	Mare Island	70 00	
USS BERGALL	SSN667	Electric Boat (Groton)	69 00	
USS SPADEFISH	SSN668	Newport News	69 00	
USS SEA HORSE	SSN669	Electric Boat (Groton)	69 00	
USS FINBACK	SSN670	Newport News	69 00	
USS NARWHAL	SSN671	Electric Boat (Groton)	69 00	
USS PINTADO	SSN672	Mare Island	70 00	
USS FLYING FISH	SSN673	Electric Boat (Groton)	69 00	
USS TREPANG	SSN674	Electric Boat (Groton)	70 00	
USS BLUEFISH	SSN675	Electric Boat (Groton)	70 00	
USS BILLFISH	SSN676	Electric Boat (Groton)	70 00	
USS DRUM	SSN677	Mare Island	71 00	
USS ARCHERFISH	SSN678	Electric Boat (Groton)	71 00	
USS SILVERSIDES	SSN679	Electric Boat (Groton)	71 00	
USS WILLIAM H. BATES	SSN680	Ingalls	72 00	
USS BATFISH	SSN681	Electric Boat (Groton)	72 00	

USS TUNNY	SSN682	73 00
USS PARCHE	SSN683	74 00
USS CAVALLA	SSN684	74 00
USS L. MENDEL RIVERS	SSN686	72 00
USS LOS ANGELES	SSN688	74 00
USS PHILADELPHIA	SSN690	76 00
USS MEMPHIS	SSN691	76 00
USS OMAHA	SSN692	77 00
USS CINCINNATI	SSN693	77 00
USS GROTON	SSN694	77 00
USS BIRMINGHAM	SSN695	78 00
USS NEW YORK CITY	SSN696	78 00
USS INDIANAPOLIS	SSN697	79 00
USS BREMERTON	SSN698	79 00
USS JACKSONVILLE	SSN699	79 00
USS DALLAS	SSN700	80 00
USS LA JOLLA	SSN701	81 00
USS PHOENIX	SSN702	81 00
USS BOSTON	SSN703	81 00
USS BALTIMORE	SSN704	82 00
USS CITY OF CORPUS CHRISTI	SSN705	82 00
USS ALBUQUERQUE	SSN706	82 00
USS PORTSMOUTH	SSN707	83 00
USS MINNEAPOLIS-SAIN T PAUL	SSN708	83 00
USS HYMAN G. RICKOVER	SSN709	84 00
USS AUGUSTA	SSN710	84 00
USS SAN FRANCISCO	SSN711	80 00
USS ATLANTA	SSN712	81 00
USS HOUSTON	SSN713	82 00
USS NORFOLK	SSN714	83 00
USS BUFFALO	SSN715	83 00
USS SALT LAKE CITY	SSN716	83 00
USS OLYMPIA	SSN717	84 00
USS HONOLULU	SSN718	85 00
USS PROVIDENCE	SSN719	85 00
USS PITTSBURGH	SSN720	85 00
USS CHICAGO	SSN721	86 00
USS KEY WEST	SSN722	87 00
USS OKLAHOMA CITY	SSN723	87 00
USS LOUISVILLE	SSN724	86 00
USS HELENA	SSN725	87 00
USS OHIO	SSBN726	80 00
USS MICHIGAN	SSBN727	82 00
USS FLORIDA	SSBN728	82 00
USS GEORGIA	SSBN729	83 00
USS HENRY M. JACKSON	SSBN730	84 00
USS ALABAMA	SSBN731	84 00
USS ALASKA	SSBN732	85 00
USS NEVADA	SSBN733	86 00
USS TENNESSEE	SSBN734	87 00
USS PENNSYLVANIA	SSBN735	88 00
USS WEST VIRGINIA	SSBN736	90 00
USS KENTUCKY	SSBN737	90 00
USS MARYLAND	SSBN738	91 00
USS NEBRASKA	SSBN739	93 00
USS NEWPORT NEWS	SSN750	88 00

## 1. DEFENSE POWER-REACTOR APPLICATIONS

## PART III MILITARY REACTORS

### B. Propulsion (Naval) (Continued)

Name (all owned by U.S. Navy)	Designation	Shipbuilder	Startup
USS SAN JUAN	SSN751	Electric Boat (Groton)	87 00
USS PASADENA	SSN752	Electric Boat (Groton)	88 00
USS ALBANY	SSN753	Newport News	89 00
USS TOPEKA	SSN754	Electric Boat (Groton)	89 00
USS MIAMI	SSN755	Electric Boat (Groton)	89 00
USS SCRANTON	SSN756	Newport News	90 00
USS ALEXANDRIA	SSN757	Electric Boat (Groton)	91 00
USS ASHEVILLE	SSN758	Newport News	91 00
USS JEFFERSON CITY	SSN759	Newport News	91 00
USS ANNAPOLIS	SSN760	Electric Boat (Groton)	91 00
USS SPRINGFIELD	SSN761	Electric Boat (Groton)	92 00
USS COLUMBUS	SSN762	Electric Boat (Groton)	93 00
USS SANTA FE	SSN763	Electric Boat (Groton)	93 00
USS BOISE	SSN764	Newport News	92 00
USS MONTPELIER	SSN765	Newport News	92 00
USS HAMPTON	SSN767	Newport News	93 00
USS LONG BEACH (2 reactors)	CGN9	Bethlehem	61 00
USS BAINBRIDGE (2 reactors)	CGN25	Bethlehem	62 00
USS TRUXTUN (2 reactors)	CGN35	NYSC	67 00
USS CALIFORNIA (2 reactors)	CGN36	Newport News	73 00
USS SOUTH CAROLINA (2 reactors)	CGN37	Newport News	74 00
USS VIRGINIA (2 reactors)	CGN38	Newport News	76 00
USS MISSISSIPPI (2 reactors)	CGN40	Newport News	78 00
USS ARKANSAS (2 reactors)	CGN41	Newport News	80 00
USS ENTERPRISE (8 reactors)	CVN65	Newport News	60 00
USS NIMITZ (2 reactors)	CVN68	Newport News	74 00
USS DWIGHT D. EISENHOWER (2 reactors)	CVN69	Newport News	77 00
USS CARL VINSON (2 reactors)	CVN70	Newport News	81 00
USS THEODORE ROOSEVELT (2 reactors)	CVN71	Newport News	86 00
USS ABRAHAM LINCOLN (2 reactors)	CVN72	Newport News	89 00
USS GEORGE WASHINGTON (2 reactors)	CVN73	Newport News	92 00
Deep Submergence Research Vehicle	NR-1	Electric Boat (Groton)	69 00

BEING BUILT	
RHODE ISLAND	
MAINE	Electric Boat (Groton)
WYOMING	Electric Boat (Groton)
LOUISIANA	Electric Boat (Groton)
CHARLOTTE	Newport News
HARTFORD	Electric Boat (Groton)
TOLEDO	Newport News
TUCSON	Newport News
COLUMBIA	Electric Boat (Groton)
GREENVILLE	Newport News
CHEYENNE	Newport News
SEAWOLF	Electric Boat (Groton)
CONNECTICUT	Electric Boat (Groton)
JOHN C. STENNIS	Newport News
UNITED STATES	Newport News

## 2. DEVELOPMENTAL POWER

### A. Electric-Power Experiments and Prototypes

(No reactors currently in this category)

### B. Propulsion Experiments and Prototypes

Name (Owner), Location	Designation	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Reactor type.	Principal nuclear contractor	Comment
<b>OPERABLE</b>							
Destroyer Reactor Prototype (DOE).	D1G			62 00	Pressurized water.	GE	
West Milton, NY							
Large Ship Reactor Prototype (2 reactors)	A1W			58 00	Pressurized water.	West.	
(DOE), INEL Site, ID							
Modifications and Additions to Reactor	MARF			76 00	Pressurized water.	GE	
Facility (DOE), West Milton, NY							
Natural Circulation Test Plant (DOE).	S5G			65 00	Pressurized water.	West.	
INEL Site, ID							
Trident Prototype, (DOE), West Milton, NY	S8G			78 00	Pressurized water.	GE	

## 3. TEST AND RESEARCH

### A. Test

(No reactors currently in this category)

### 3. TEST AND RESEARCH

### PART III MILITARY REACTORS

#### B. Research

Name (Owner), Location	Designation	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Reactor type. Principal nuclear contractor	Comment
<b>OPERABLE</b>						
Armed Forces Radiobiology Research Institute, DNA (DOD), Regulated by NRC, Bethesda, MD	AFRRRI	1,100.0	62 00		TRIGA-Mk F. GA	
Army Pulse Radiation Facility, Test and Evaluation Command (USA), Aberdeen, MD	APRF	10.0	68 07		Bare, fast, prompt burst. UNC	
Fast Burst Reactor Facility, Test and Evaluation Command (USA), White Sands, NM	FBRF	10.0	64 08		Bare, fast, prompt burst. Kaman	
Stationary Neutron Radiography System (USAF), McClellan AFB, CA	SNRS-1	1,300.0	91 01		TRIGA Mod Mark II. GA	

#### 1. POWER REACTORS

#### A. Central-Station Electric Power Plants

Reactor Name (Owner), Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Authorized power kW(t)	Initial criticality (yr mo)	Comment
<b>OPERABLE</b>							
Belgium, Doel, Unit 1. Antwerp	West.	Pressurized water	392.0	1,192.0		75 00	
Belgium, Doel, Unit 2. Antwerp	West.	Pressurized water	392.0	1,192.0		75 00	
Belgium, Doel, Unit 4. Antwerp	West.	Pressurized water	1,006.0	3,000.0		85 00	
Belgium, Tihange, Unit 1. Huy, Liege	West.	Pressurized water	870.0	2,660.0		75 00	
Belgium, Tihange, Unit 3. Huy, Liege	West.	Pressurized water	1,006.0	3,000.0		85 00	
Brazil, Angra 1, Central Electricia de Furnas, Angra dos Reis	West.	Pressurized water	626.0	1,882.0		85 00	
Germany, Mülheim-Kärlich (Rheinisch-Westfälisches Elektrizitätswerk AG).	XR-081 04/13/73 XR-118 06/28/77			1,200.0		87 10	

India, Tarapur Nuclear Power Station, Unit 1. Tarapur (near Bombay)	XR-054 07/07/64	GE. Boiling water	200.0	707.0	69 00
India, Tarapur Nuclear Power Station, Unit 2. Tarapur (near Bombay)	XR-054 07/07/64	GE. Boiling water	200.0	707.0	69 00
Italy, Caorso Nuclear Station (ENEL). Piacenza/Cremona Italy, Trino Vercellese (ENEL). Trino, Piedmont	XR-077 04/02/71 XR-044 06/14/62 XR-066 08/15/67	GE. Boiling water West. Pressurized water GE. Boiling water	840.0 247.0 439.0	2,651.0 870.0 1,380.0	79 00 65 00 70 10
Japan, Fukushima Dai-ichi Power Station, Unit 1 (Tokyo Electric Power Co.). Okuma, Fukushima Pref. Japan, Fukushima Dai-ichi Power Station, Unit 2 (Tokyo Electric Power Co.). Okuma, Fukushima Pref.	XR-072 04/22/70	GE, Toshiba. Boiling water	760.0	2,381.0	73 05
Japan, Fukushima Dai-ichi Power Station, Unit 6 (Tokyo Electric Power Co.). Futaba, Fukushima Pref. Japan, Mihami Power Station, Unit 1 (Kansai Electric Power Co.). Mihami, Fukui Pref. Japan, Ohi Power Station, Unit 1 (Kansai Electric Power Co.). Ohi, Fukui Pref.	XR-084 05/25/73	GE, Toshiba. Boiling water	1,067.0	3,293.0	79 03
Japan, Mihami, Fukui Pref. Japan, Ohi Power Station, Unit 2 (Kansai Electric Power Co.). Ohi, Fukui Pref. Japan, Takahama Power Station, Unit 1 (Kansai Electric Power Co.). Takahama, Fukui Pref. Japan, Tokai No. 2 Power Station (Japan Atomic Power Co.). Tokai-Mura, Ibaraki Pref.	XR-067 08/15/67	West., Mitsubishi. Pressurized water	320.0	1,031.0	70 07
Japan, Ohi Power Station, Unit 1 (Kansai Electric Power Co.). Ohi, Fukui Pref. Japan, Takahama Power Station, Unit 1 (Kansai Electric Power Co.). Takahama, Fukui Pref. Japan, Tokai No. 2 Power Station (Japan Atomic Power Co.). Tokai-Mura, Ibaraki Pref.	XR-082 04/17/73	West., Mitsubishi. Pressurized water	1,120.0	3,423.0	77 12
Japan, Ohi Power Station, Unit 2 (Kansai Electric Power Co.). Ohi, Fukui Pref. Japan, Takahama Power Station, Unit 1 (Kansai Electric Power Co.). Takahama, Fukui Pref. Japan, Tokai No. 2 Power Station (Japan Atomic Power Co.). Tokai-Mura, Ibaraki Pref.	XR-082 04/17/73	West., Mitsubishi. Pressurized water	1,120.0	3,423.0	78 09
Japan, Ohi Power Station, Unit 2 (Kansai Electric Power Co.). Ohi, Fukui Pref. Japan, Takahama Power Station, Unit 1 (Kansai Electric Power Co.). Takahama, Fukui Pref. Japan, Tokai No. 2 Power Station (Japan Atomic Power Co.). Tokai-Mura, Ibaraki Pref.	XR-079 07/23/71	West., Mitsubishi. Pressurized water	780.0	2,440.0	74 03
Japan, Ohi Power Station, Unit 2 (Kansai Electric Power Co.). Ohi, Fukui Pref. Japan, Takahama Power Station, Unit 1 (Kansai Electric Power Co.). Takahama, Fukui Pref. Japan, Tokai No. 2 Power Station (Japan Atomic Power Co.). Tokai-Mura, Ibaraki Pref.	XR-085 05/25/73	GE, Hitachi, Shimizu. Boiling water	1,080.0	3,293.0	78 01
Japan, Ohi Power Station, Unit 2 (Kansai Electric Power Co.). Ohi, Fukui Pref. Japan, Takahama Power Station, Unit 1 (Kansai Electric Power Co.). Takahama, Fukui Pref. Japan, Tokai No. 2 Power Station (Japan Atomic Power Co.). Tokai-Mura, Ibaraki Pref.	XR-065 06/22/67	GE. Boiling water	341.0	1,064.0	69 10
Korea, Kori-1 (Korea Electric Power Co.). Kori (near Pusan) Korea, Kori-2 (Korea Electric Power Co.). Kori (near Pusan) Korea, Kori-3 (Korea Electric Power Co.). Kori (near Pusan) Korea, Kori-4 (Korea Electric Power Co.). Kori (near Pusan) Korea, Yonggwang-1 (Korea Electric Power Co.). Gyema (near Kwang Ju)	XR-083 05/04/73 XR-119 04/08/77 XR-131 10/04/78 XR-131 10/04/78 XR-133 09/22/80	West. Pressurized water West. Pressurized water West. Pressurized water West. Pressurized water West. Pressurized water	564.0 605.0 900.0 900.0 900.0 900.0 900.0	1,729.0 1,876.0 2,775.0 2,775.0 2,775.0 2,775.0 2,775.0	78 00 83 00 85 00 85 00 86 00 87 00
Korea, Kori-1 (Korea Electric Power Co.). Kori (near Pusan) Korea, Kori-2 (Korea Electric Power Co.). Kori (near Pusan) Korea, Kori-3 (Korea Electric Power Co.). Kori (near Pusan) Korea, Kori-4 (Korea Electric Power Co.). Kori (near Pusan) Korea, Yonggwang-1 (Korea Electric Power Co.). Gyema (near Kwang Ju)	XR-133 09/22/80	West. Pressurized water	900.0	2,777.0	Formerly, Korea, Unit 1. Formerly, Korea, Unit 2. Formerly, Korea, Unit 5. Formerly, Korea, Unit 6. Formerly, Korea, Unit 7.
Mexico, Laguna Verde Station, Unit 1. Laguna Verde Netherlands, Dodewaard (GKN). Dodewaard, Betuwe	XR-098 05/17/74 XR-058 09/15/65	GE. Boiling water GE. Boiling water	654.0 55.0	1,931.0 183.0	88 11 68 06
					Commercial operation, 7/29/90. In 1984 the reactor's nominal power was raised from 163.4 MW(i) to 183 MW(i). The reactor's cooling is by natural circulation only.

## A. Central-Station Electric Power Plants (Continued)

Reactor Name (Owner), Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Authorized power kW(t)	Initial criti-cali-ty (yr mo)	Comment
Slovenia, Krsko (Nuklearna Elektarina Krsko), Krsko	XR-107 05/20/77	West. Pressurized water	615.0	1,882.0		83 00	
Spain, Almaraz, Unit 1 (Union Electrica, S.A.), Almaraz	XR-088 07/12/73	West. Pressurized water	902.0	2,696.0		81 00	
Spain, Almaraz, Unit 2 (Union Electrica, S.A.), Almaraz	XR-088 07/12/73	West. Pressurized water	902.0	2,696.0		83 00	
Spain, Asco, Unit 1 (FECSA), Asco	XR-090 07/12/73	West. Pressurized water	902.0	2,696.0		83 00	
Spain, Asco, Unit 2 (FECSA), Asco	XR-099 06/22/76	West. Pressurized water	902.0	2,696.0		85 00	
Spain, Cofrentes, Unit 1 (Hidroelectrica Espanola S.A.), Cofrentes	XR-097 06/10/74	GE. Boiling water	975.0	2,900.0		84 00	
Spain, José Cabrera (Union Electrica, S.A.), Zonita de los Canes	XR-059 10/22/65	West. Pressurized water	160.0	510.0		69 00	
Spain, Santa María de Garoña (Centrales Nucleares del Norte, S.A., Nucleon), S.M. Garoña Burgos	XR-064 06/09/67	GE. Boiling water	440.0	1,381.0		70 00	
Spain, Vandellós, Unit 2 (ENHER), Tarragona	XR-122 09/13/87	West. Pressurized water	920.0	2,785.0		88 03	
Sweden, Ringhals, Unit 2 (Vattenfall AB), Väro (near Göteborg)	XR-069 05/09/69	West. Pressurized water	870.0	2,660.0		74 10	
Sweden, Ringhals, Unit 3 (Vattenfall AB), Väro (near Göteborg)	XR-095 02/02/74	West. Pressurized water	915.0	2,783.0		81 00	
Sweden, Ringhals, Unit 4 (Vattenfall AB), Väro (near Göteborg)	XR-103 10/21/75	West. Pressurized water	915.0	2,783.0		83 00	
Switzerland, Beznau, Unit 1 (Nordostschweizerische Kraftwerke AG), Döttingen	XR-063 02/03/67	West. Pressurized water	350.0	1,130.0		69 00	
Switzerland, Beznau, Unit 2 (Nordostschweizerische Kraftwerke AG), Döttingen	XR-070 11/05/69	West. Pressurized water	350.0	1,130.0		71 00	
Switzerland, Leibstadt (Kemkraftwerk Leibstadt)	XR-104 12/31/75	GE. Boiling water	990.0	3,138.0		84 00	
Switzerland, Mühleberg (Bernische Kraftwerke AG), Mühleberg (near Bern)	XR-068 10/04/67	GE. Boiling water	320.0	997.0		72 00	
Taiwan, Chinshan, Unit 1 (Taiwan Power Co.), Shihmen	XR-080 07/24/72	GE. Boiling water	604.0	1,775.0		77 10	
Taiwan, Chinshan, Unit 2 (Taiwan Power Co.), Shihmen	XR-080 07/24/72	GE. Boiling water	604.0	1,775.0		78 11	

Taiwan, Kuo Sheng, Unit 1 (Taiwan Power Co.). Wanli Hsiang	XR-096 04/17/74	GE. Boiling water	948.0	2,894.0	81 02
Taiwan, Kuo Sheng, Unit 2 (Taiwan Power Co.). Wanli Hsiang	XR-096 04/17/74	GE. Boiling water	948.0	2,894.0	82 03
Taiwan, Maanshan, Unit 1 (Taiwan Power Co.). Heng-chun	XR-113 06/08/79	West. Pressurized water	890.0	2,785.0	84 03
Taiwan, Maanshan, Unit 2 (Taiwan Power Co.). Heng-chun	XR-113 06/08/79	West. Pressurized water	890.0	2,785.0	85 02
<b>BEING BUILT</b>					
England, Sizewell B (Central Electricity Generating Board), Suffolk	XR-148 07/30/86	West. Pressurized water	1,188.0	3,425.0	94 00
Japan, Kashiwazaki-Kariwa, Unit 6 (Tokyo Electric Power Co.). Kashiwazaki, Niigata Pref.	XR-150 04/16/87	GE, Toshiba. Advanced boiling water	1,356.0	3,930.0	96 12
Japan, Kashiwazaki-Kariwa, Unit 7 (Tokyo Electric Power Co.). Kashiwazaki, Niigata Pref.	XR-150 04/16/87	GE, Hitachi. Advanced boiling water	1,356.0	3,930.0	97 07
Korea, Yonggwang-3 (Korea Electric Power Co.), Gyema (near Kwang Ju)	XR-150 04/16/87	Comb. Pressurized water	900.0		95 00
Korea, Yonggwang-4 (Korea Electric Power Co.), Gyema (near Kwang Ju)	XR-102 10/24/74	GE. Boiling water	654.0	1,931.0	95 12
Mexico, Laguna Verde Station, Unit 2, Laguna Verde	XR-120 05/06/80	West. Pressurized water	620.0	1,876.0	Indef.
Philippines, Republic of the Philippines Nuclear Power Plant, Unit 1 (National Power Corp.). Morong, Bataan Prov., Luzon	XR-089 07/12/73	West. Pressurized water	900.0	2,696.0	Indef.
Spain, Lemoniz, Unit 1. Lemoniz, Lemoniz, Unit 2.	XR-089 07/12/73	West. Pressurized water	900.0	2,696.0	Indef.
Spain, Valdecaballeros, Unit 1 (HE: Sevillana de Electricidad). Valdecaballeros, Badajos	XR-110 05/05/77	GE. Boiling water	975.0	2,894.0	Indef.
Spain, Valdecaballeros, Unit 2 (HE: Sevillana de Electricidad). Valdecaballeros, Badajos	XR-110 05/05/77	GE. Boiling water	975.0	2,894.0	Indef.
<b>PLANNED</b>					
Korea, Ulchin 3 (Korea Electric Power Co.). Kuongsangbuk-do	XR-153 04/06/92	Comb. Pressurized water	950.0	2825.0	
Korea, Ulchin 4 (Korea Electric Power Co.). Kuongsangbuk-do	XR-153 04/06/92	Comb. Pressurized water	950.0	2825.0	
Taiwan, Unit 7 (Taiwan Power Co.). Langmen	02/17/81		1,000.0		99 00
Taiwan, Unit 8 (Taiwan Power Co.). Langmen	02/17/81		1,000.0		

The NRC has issued three licenses to vendors for this reactor: XR-134, -135, and -136. Only the vendor who wins the contract will be allowed to use its license.

The NRC has issued three licenses to vendors for this reactor: XR-134, -135, and -136. Only the vendor who wins the contract will be allowed to use its license.

## 1. POWER REACTORS (Continued)

## PART IV EXPORT REACTORS

### B. Propulsion

(No reactors currently in this category)

## 2. TEST, RESEARCH, AND TEACHING

### A. General Irradiation Test

Reactor Name (Owner), Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Authorized power kW(t)	Initial criti- cal- ity (yr mo)	Comment
<b>OPERABLE</b>							
Japan, JRR-2 (Japan Atomic Energy Research Institute). Tokai-Mura, Ibaraki Pref.	XR-015 10/11/57	AMF. Heavy water, CP-5			10,000.0	60 10	
Japan, NSRR (Japan Atomic Energy Research Institute). Tokai-Mura, Ibaraki Pref.	XR-101 10/16/74	GA. TRIGA-ACPR			300.0	75 06	
Netherlands (Energy Center). Petten	XR-017 01/17/58	AC. Tank (MTR)			45,000.0	61 09	In 1985 the reactor vessel was replaced. It is now refurbished. Manufacturer of the vessel: Royal Schelede of Flushing (Vlissingen, Holland).
Romania (Institute for Nuclear Research). Bucharest	XR-091 06/29/73	GA. TRIGA-ACPR			500.0	79 00	
Romania (Institute for Nuclear Research). Bucharest	XR-091 06/29/73	GA. TRIGA (MPR 16)			14,000.0	79 00	
South Africa, Safari-1 (Atomic Energy Board). Pelindaba (near Pretoria)	XR-042 06/14/61	AC. Tank			20,000.0	65 00	
Sweden (Studsvik Energiteknik). Studsvik	XR-019 05/14/58	AC. Tank (MTR)			50,000.0	60 00	

### B. General Research

Reactor Name (Owner), Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Initial criti- cal- ity (yr mo)	Comment	
<b>OPERABLE</b>							
Australia, Moata (Atomic Energy Commission). Lucas Heights, New South Wales	XR-039 09/12/60	AR. UTR-10			15.0	61 00	
Austria, Asira (Seibersdorf Research Center). Seibersdorf	XR-023 09/03/58	AMF. Pool			5,000.0	60 00	
Bangladesh (Institute of Nuclear Technology). Dhaka	XR-126 10/05/82	GA. TRIGA-Mk II			3,000.0	86 00	
Colombia, IAN-R1 (Institute of Nuclear Affairs). Bogotá	XR-053 05/27/64	Lockheed. Pool			20.0	65 00	
Denmark, DR-1 (Risø National Laboratory). Risø	XR-005 04/04/57	AI. L-55			2.0	57 00	
England (Imperial Chemical Industries). Billingham, Teeside	XR-074 03/23/71	GA. TRIGA-Mk I			250.0	71 00	

Greece, Democritos (Atomic Energy Commission), Athens	XR-014 09/25/57	AMF. Pool	1,000.0	61 00
Indonesia (National Atomic Energy Agency), Bandung	XR-048 01/08/59	GA. TRIGA-Mk II	1,000.0	64 00
Indonesia (National Atomic Energy Agency), Yogyakarta	250.0	GA. TRIGA-Mk II	250.0	79 00
Israel (Atomic Energy Commission), Nahal Soreq	XR-021 06/12/58	AMF. Pool	5,000.0	60 00
Italy (Italian Agency for New Technology, Energy and the Environment), Rome	XR-026 01/08/59	GA. TRIGA-MR II	1,000.0	60 00
Jamaica (Kingston), Kingston	XR-094 06/03/75	Research reactor		Design power: 10W.
Korea (Advanced Energy Research Institute), Seoul	XR-027 05/21/59	GA. TRIGA-Mk II	250.0	62 00
Korea (Advanced Energy Research Institute), Seoul	XR-073 05/15/70	GA. TRIGA-Mk III	2,000.0	72 00
Malaysia (Tun Ismail Atomic Research Centre), Kuala Lumpur	XR-125 02/20/81	GA. TRIGA-Mk II	1,000.0	82 00
Mexico (National Commission for Nuclear Energy), Salazar	XR-057 02/12/65	GA. TRIGA-Mk III	1,000.0	68 00
Pakistan, PARR (Atomic Energy Commission), Islamabad	XR-046 04/23/62	AMF. Pool	5,000.0	65 00
Philippines, Republic of the, PRR-1 (Philippine Nuclear Research Institute), Quezon City	XR-034 11/16/59	GA. TRIGA Conversion	3,000.0	88 03
Portugal, RP-1 (National Laboratory of Engineering and Industrial Technology), Sacavém	XR-013 09/13/57	AMF. Pool	1,000.0	61 00
Slovenia (Josef Stefan Nuclear Institute), Ljubljana	XR-055 01/30/64	GA. TRIGA-Mk II	500.0	66 00
Spain (Nuclear Energy Board-JEN), Madrid	XR-010 07/29/57	GE. Pool	3,000.0	58 00
Switzerland (Paul Scherrer Institute), Würenlingen	XR-112 05/05/77	ORNL. Pool Conversion	10,000.0	57 00
Thailand, TRR-1 (Office of Atomic Energy for Peace), Bangkok		GA. TRIGA-Mk III	2,000.0	77 11
Turkey (Atomic Energy Commission), Istanbul	XR-030 09/04/59	AMF. Pool	1,000.0	62 00
Turkey (Technical University of Istanbul), Istanbul	XR-108 03/24/76	GA. TRIGA-Mk II	250.0	79 00

GA: This reactor was designed and built by BATAN

(National Atomic Energy Agency of Indonesia). The design was based on the design of TRIGA Mark II reactor, with maximum power level of 250 kW. In 1979 this reactor reached initial criticality at 50 kW. After the upgrading and replacing of some components, it reached a power level of 100 kW in 1984. BATAN: The original Bandung TRIGA-Mark II reactor was commissioned at 250 kW(t) in 1964. It was upgraded and reached a power level of 1000 kW(t) in 1971.

Additional NRC export license No. and date: XR-078, 5/20/71.

GA: This reactor was designed and built by BATAN (National Atomic Energy Agency of Indonesia). The design was based on the design of TRIGA Mark II reactor, with maximum power level of 250 kW. In 1979 this reactor reached initial criticality at 50 kW. After the upgrading and replacing of some components, it reached a power level of 100 kW in 1984. BATAN: The original Bandung TRIGA-Mark II reactor was commissioned at 250 kW(t) in 1964. It was upgraded and reached a power level of 1000 kW(t) in 1971.

The original Philippine Research Reactor (PRR-1) was designed and built by GE and was commissioned as a 1 MW reactor in 1963. The reactor was shut down in 1/85 for extensive upgrading and has now become a TRIGA Conversion. It has a power level of 3 MW and reached criticality on 3/11/88.

This is the 1955 Geneva conference reactor rebuilt with increased power.

The Thai research reactor, TRR-1, built by Curtiss-Wright and started up in 1962, originally operated at 1000 kW(t). In 6/75 the TRR-1 was shut down for conversion to TRR-1/M1, a TRIGA-Mark III system adapted for pool installation. The TRR-1/M1, with a power level of 2000 kW(t)/2000 MW pulsing was commissioned 11/77.

## 2. TEST, RESEARCH, AND TEACHING

## PART IV EXPORT REACTORS

### B. General Research (Continued)

Reactor Name (Owner). Location	NRC export license No. and date	Principal nuclear contractor. Reactor type	Power design net MW(e)	Power MW(t)	Authorized power kW(t)	Initial criticality (yr mo)	Comment
<b>OPERABLE (Continued)</b>							
Venezuela (Institute for Scientific Research). Caracas	XR-018 01/16/58	GE. Pool		3,000.0	60 00		
Zaire (Regional Center for Nuclear Studies). Kinshasa		GA. TRIGA-Mk II		1,000.0	59 00		This TRIGA reactor operated at the 1958 International Conference in Geneva prior to shipment to the University of Lovanium in 6/59. It is the first reactor to be operated on the African continent.
BEING BUILT							
Morocco (C.E.N., Maâmora). Rabat	XR-158 10/25/91	GA. TRIGA-Mk II		3,000.0			Originally planned as TRIGA-Mk I, reactor was upgraded to TRIGA-Mk II. Original export license was not used.
PLANNED							
Albania. Tirana	XR-154 Pending	GA. TRIGA-Mk I		250.0			Export license application dated 10/9/90.

### C. University Research and Teaching

OPERABLE	Austria (Vienna Polytechnic Institutuc). Vienna	XR-035 11/24/59	GA. TRIGA-Mk II	250.0	62 00		
	Brazil (University of Minas Gerais). Belo Horizonte	XR 028 08/03/59	GA. TRIGA-Mk I	100.0	60 00		
	Brazil (University of São Paulo). São Paulo	XR-002 01/22/57	B&W. Pool	5,000.0	57 00		
	Canada (McMaster University). Hamilton, Ontario	XR-011 08/27/57	AMF. Pool	5,000.0	59 00		
	China, Republic of (National Tsing-Hua University). Hsinchu	XR-020 06/05/58	GE. Pool	1,000.0	62 00		
	Finland (Institute of Technology). Helsinki	XR-040 04/05/61	GA. TRIGA-Mk II	250.0	62 00		
	Germany (Institute for Nuclear Medicine). Heidelberg	XR-060 02/14/66	GA. TRIGA-Mk I	250.0	66 00		
	Germany (Johannes Gutenberg University of Mainz). Mainz	XR-050 04/11/64	GA. TRIGA-Mk II	100.0	65 00		
	Germany (Medical College of Hanover). Hanover	XR-076 02/26/71	GA. TRIGA-Mk I	250.0	73 00		
	Germany, FRM Gersching (Technical University of Munich). Munich	XR-004 03/15/57	AMF. Pool	4,000.0	57 00		
	Germany (University of Mainz). Mainz						This TRIGA-Mk I reactor was installed in 1966. In 1977, the reactor was shut down, dismantled, and moved to another building. After this move, it was started up again in 1978. This operation was referred to as "TRIGA I" and "TRIGA II."

Iran (University of Tehran).	XR-029	AMF. Pool	5,000.0	67 00	Fuel supplier being sought.
Teheran	08/05/59	AGN. 201-110		60 00	Negligible power. Shut down for renewal of operating license.
Italy (University of Palermo).	XR-025				Shut down for renewal of operating license.
Palermo	01/07/59				
Italy (University of Pavia).	XR-056	GA. TRIGA-Mk II	250.0	65 00	
Pavia	03/12/65				
Japan (Kinki University).	XR-041	AR. UTR-10		61 11	Negligible power.
Higashi-Osaka	04/18/61				
Japan (Musashi College of Technology).	XR-037	GA. TRIGA-Mk II	100.0	63 01	
Kawasaki	07/08/60				
Japan (Rikkyo University).	XR-038	GA. TRIGA-Mk II	100.0	61 12	
Yokosuka	07/08/60				
Korea (University of Kyung Hee).	XR-105	AGN. 201		82 00	Negligible power.
Seoul	11/18/75				
Netherlands (Delft Technical University).	XR-003	AMF. Pool (MTR)	2,000.0	63 04	The Netherlands research reactor was originally operated at the Amsterdam International Exhibition in 6/57; major portions of the exhibition reactor system were used to fabricate the present reactor.
Delft	02/01/57				
Switzerland (University of Basel).	AGN. 211-100			58 00	This reactor was operated in the International Science Section of the Brussels Information Exhibition, 4/15/58 to 10/15/58, prior to transfer to the University of Basel. Negligible power.

## 1. CIVILIAN

## PART V CRITICAL ASSEMBLIES

Facility (Regulatory Agency)	Designation	Location	No. of cells	No. of control panels/room	Abbreviation	Initial criticality (yr mo)	Comment	Equipment
Advanced Test Reactor Critical Facility (DOE)	ATRC	INEL Site, ID	1	1	ATRC	64 00	ATR physics, core-loading and core-design measurements.	
Argonne National Laboratory, Idaho Division (DOE)	ZPPR	INEL Site, ID	1	1	ANL-IDAHO	69 00	To be shut down FY95.	
Los Alamos National Laboratory (DOE)	Big Ten	Los Alamos, NM			LANL, Kiva II	72 00	U(10)-metal cylinder in thick metal reflector.	
Los Alamos National Laboratory (DOE)	Comet	Los Alamos, NM			LANL, Kiva II	52 00	Critical-configuration safety and neutronic tests.	
Los Alamos National Laboratory (DOE)	Flatop	Los Alamos, NM	1	1	LANL, Kiva II	57 00	Spherical metal cores in thick metal reflector.	
Los Alamos National Laboratory (DOE)	Godiva-IV	Los Alamos, NM			LANL, Kiva III	67 00	Fast neutron irradiation, pulse capability.	
Los Alamos National Laboratory (DOE)	Honeycomb	Los Alamos, NM			LANL, Kiva I	56 00	Flexible split table assembly.	
Los Alamos National Laboratory (DOE)	Mars	Los Alamos, NM			LANL, Kiva I	74 00	Vertical table assembly machine.	
Los Alamos National Laboratory (DOE)	Planet	Los Alamos, NM			LANL, Kiva II	84 00	Vertical table assembly.	
Los Alamos National Laboratory (DOE)	SHEBA	Los Alamos, NM	2	1	LANL, Kiva I	80 00	Solution high energy burst assembly.	
Los Alamos National Laboratory (DOE)	SKUAA	Los Alamos, NM	1	1	LANL, Kiva III	78 00	Fast neutron irradiation, pulse capability.	
Rensselaer Polytechnic Institute (NRC)	Troy, NY	Troy, NY	1	1	Rensselaer	66 00	Critical experiment assembly.	
SNL Critical Assembly (DOE)	CX	Kirland AFB East, NM			Sandia	89 09	Space power neutronics.	

## 2. MILITARY

## PART V CRITICAL ASSEMBLIES

Facility (Regulatory Agency)	Designation	Location	No. of cells	No. of control panels/room	Initial criticality (yr mo)	Comment	Equipment
							Abbreviation
Knolls Atomic Power Laboratory (DOE)	FCPE	Schenectady, NY	2	1	70.00	Full core physics experiment.	KAPI
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Horizontal/ Split Table	Golden, CO			65.00	Critical-configuration safety tests.	RFP-NSF
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Solution Base	Golden, CO	1	1	65.00	Critical-configuration safety tests.	RFP-NSF

**REACTORS AND FACILITIES  
SHUTDOWN OR DISMANTLED**



# REACTORS AND FACILITIES SHUTDOWN OR DISMANTLED

## 1. POWER REACTORS

### A. Central-Station Electric Power Plants

Name (licensee) [docket number]	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power licensed MW(t)	Initial critically permanently (yr mo)	Shut down permanently (yr mo)	Comment
Boiling Nuclear Superheater Power Station (AEC and Puerto Rico Water Resources Authority)	Puerto Rico, PR	Comb.	Boiling water, integral nuclear superheat	16.5	50.0	64.00	68.00	
Carolinas-Virginia Tube Reactor (Carolinas-Virginia Nuclear Power Associates, Inc.)	Charleston, SC	West.	Pressure tube, heavy water	17.0	64.0	63.00	67.01	The last CVTR shutdown occurred 1/24/67. A license amendment issued 6/14/67 authorizes CVNPA to possess but not operate the CVTR.
Dresden Nuclear Power Station, Unit 1 (Commonwealth Edison Co.) [50-010]	Morris, IL	GE	Boiling water	200.0	700.0	59.00	78.10	
Elk River Reactor (AEC and Rural Cooperative Power Association)	Elk River, MN	AC	Boiling water	22.0	58.2	62.00	68.02	The Elk River Reactor was shut down due to technical problems in February 1968; in 1974, dismantling and removal of this facility was completed.
Enrico Fermi Atomic Power Plant, Unit 1 (Power Reactor Development Co.) [50-16]	Lagoona Beach, MI	PRDC	Sodium cooled, fast	60.9	200.0	63.00	72.09	
Fort St. Vrain Nuclear Generating Station (Public Service Company of Colorado) [50-267]	Platteville, CO	GA	High temperature, gas cooled	330.0	842.0	74.01	89.08	
Hallam Nuclear Power Facility, Sheldon Station (AEC and Consumers Public Power District)	Hallam, NE	AI	Sodium graphite	75.0	240.0	62.00	64.09	The Hallam Nuclear Power Facility was shut down in September 1964 due to moderator-can failures. Entombment of the reactor was completed in 1968.
Humboldt Bay Power Plant, Unit 3 (Pacific Gas & Electric Co.) [50-133]	Eureka, CA	GE	Boiling water	65.0	242.0	63.00	76.07	
Indian Point Station, Unit 1 (Consolidated Edison Co. of New York, Inc.) [50-3]	Buchanan, NY	B&W	Pressurized water	265.0	615.0	62.00	74.10	In the Consolidated Edison Indian Point Station, the 615 MW(t) was increased by an oil-fired superheater to produce 265 MW(e) net.
La Crosse (Genoa) Nuclear Generating Station (Dairyland Power Cooperative) [50-409]	La Crosse, WI	AC	Boiling water	48.0	165.0	67.07	87.04	
Pathfinder Atomic Plant (Northern States Power Co.)	Sioux Falls, SD	AC	Boiling water	58.5	190.0	64.00	67.09	The Pathfinder Plant has been shut down since November 1967. On Sept. 9, 1968, Northern States Power Company announced plans to install gas-fired boilers for operation the summer of 1969.
Peach Bottom Atomic Power Station, Unit 1 (Philadelphia Electric Co.) [50-171]	Peach Bottom, PA	GA	High temperature, gas cooled	40.0	115.0	66.00	74.10	

## 1. POWER REACTORS

## PART I CIVILIAN REACTORS (DOMESTIC)

### A. Central Station Electric Power Plants (Continued)

Name (licensee) (docket number)	Location	Principal nuclear contractor	Type	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down permanently (yr mo)	Comment
Piqua Nuclear Power Facility (AEC and City of Piqua)	Piqua, OH	AI	Organic cooled and moderated	11.4	45.5	63 00	66 00	The dismantlement program for the Piqua Nuclear Power Facility was completed in February 1969.
Rancho Seco Nuclear Generating Station, Unit 1 (Sacramento Municipal Utility District) [50-312]	Clay Station, CA	B&W	Pressurized water	873.0	2,772.0	74 09	89 06	Possession only license, 3/92.
San Onofre Nuclear Generating Station, Unit 1 (Southern California Edison) [50-206]	San Clemente, CA	West.	Pressurized water	436.0	1,347.0	67 06	92 11	Possession only license is contingent as of 10/92 on the fuel being removed.
Shippingport Atomic Power Station (DOE and Duquesne Light Co.)	Shippingport, PA	West.	Pressurized water	60.0	236.0	57 00	82 10	The first core for the Shippingport station began power operation in 1957, with a capacity rating of 60 MW(e). The second core began power operation in 1965 with a capacity rating of 90 MW(e). The third core, a light water breeder reactor (LWBR), began power operation in 1977, with a capacity rating of 60 MW(e). Owned by the Department of Energy, the reactor plant was shut down on Oct. 1, 1982. Defueling was completed in September 1984. Decommissioning was completed in December 1989, and the site was released for use without any restrictions. Possession only license, 7/20/91.
Shoreham Nuclear Power Station (Long Island Lighting Co.) [50-322]	Brookhaven, NY	GE	Boiling water	820.0	2,436.0	85 02	91 07	
Three Mile Island Nuclear Station, Unit 2 (GPU Nuclear Corp.) [50-320]	Middletown, PA	B&W	Pressurized water	906.0	2,772.0	78 00	79 00	Three Mile Island Nuclear Station, Unit 2, has been shut down since the 3/28/79 accident. Core removal is finished.
Trojan Nuclear Plant, Unit 1 (Portland General Electric Co.) [50-344]	Prescott, OR	West.	Pressurized water	1075.0	3411.0	75 12	93 00	Possession only license, 5/5/93.
Yankee Nuclear Power Station (Yankee Atomic Electric Co.) [50-029]	Rowe, MA	West.	Pressurized water	167.0	600.0	60 08	92 02	Licensor announced permanent shutdown, 2/92. Possession only license, 8/92.

### B. Dual-Purpose Plants

Name (Owner)	Location	Principal nuclear contractor	Type	Power capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Comment
N Reactor (DOE)	Hanford Site, WA	WHC	Graphite	860.0	4000.0	63 12	91 00	N Reactor, a DOE-owned reactor for production of special nuclear materials, also produced steam that was supplied to an adjacent electric generating plant, owned and operated by Washington Public Power Supply System. The reactor has been directed to transition from standby to the termination mode in preparation for decommissioning.

## C. Propulsion (Maritime)

Name and/or owner	Nuclear designer	Shipbuilder	Type	Maximum shaft horsepower	Licensed power MW(e)	Start-up (yr mo)	Shut down (yr mo)
Nuclear Ship SAVANNAH (Maritime Administration)	B&W	NYSC	Pressurized water	22,000	80.0	61 00	71 00

## 2. EXPERIMENTAL POWER-REACTOR SYSTEMS

### A. Electric-Power Systems

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Desig. Type. Principal nucl. contr.	Comment
Boiling Reactor Experiment No 1 (DOE), INEL Site, ID	1,400.0							BORAX-1 Boiling water, ANL	
Boiling Reactor Experiment No. 5 (DOE), INEL Site, ID	2,600.0	20,000.0						BORAX-5 Boiling water, integral nuclear superheat, ANL	
Boiling Reactor Experiments (DOE), INEL Site, ID	2,400.0	15,500.0						BORAX-2,-3,-4. Boiling water, ANL	This facility was originally built and operated in 1954 as the Boiling Reactor Experiment No. 2 (BORAX-2). With the addition of a turbogenerator, it operated during 1955 as BORAX-3 and on 7/17/55 produced sufficient electricity to light and power Arches, ID—a U.S. first. BORAX-4, a further modification, operated from 12/56 to 6/58, when the experiment was shut down.
ESADA Vallecitos Experimental Superheat Reactor (NRC), Pleasanton, CA	17,000.0							EVESR. Light-water moderated, superheater, GE	Owner: Empire States Atomic Development Associates and General Electric Company.
Experimental Beryllium Oxide Reactor (DOE), INEL Site, ID	10,000.0							EBOR. Gas cooled, BeO moderated, GA	The EBOR reactor experiment was terminated in December 1966 prior to completion of construction.
Experimental Boiling Water Reactor (DOE), Argonne, IL	4,000.0	100,000.0						EBWR. Boiling water, ANL	Operation of EBWR in the Boiling Water Program was closed out 12/62. The reactor was used in support of the Plutonium Recycle Program and attained criticality using plutonium as its principal fuel 9/22/65. In support of that program, it operated at power levels as high as 70,000 kW(t). Operation in that program was completed 6/67.

## 2. EXPERIMENTAL POWER-REACTOR SYSTEMS

## PART I CIVILIAN REACTORS (DOMESTIC)

### A. Electric-Power Systems (Continued)

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Desig. Type. Principal nucl. contr.	Comment
Experimental Breeder Reactor No. 1 (DOE). INEL Site, ID	150.0	1,400.0			51.00	64.00		EBR-1. NaK-cooled, fast. ANL	In a trial run 12/21/51 and 12/22/51, EBR-1 generated the world's first electric power from nuclear energy and was first to demonstrate, in 7/53, the feasibility of breeding and the compatibility with breeding economy of sodium-potassium alloy as a liquid-metal coolant. It operated with a plutonium-bearing core (Mark IV) from 11/62 to 12/63. The reactor was decommissioned and dismantled early in 1964. The facility was dedicated as a historic landmark 8/26/66. It is open to the public from Memorial Day weekend to Labor Day weekend, annually.
EGCR								The EGCR project was terminated 1/66 prior to the completion of construction.	
Experimental Gas Cooled Reactor (DOE). Oak Ridge, TN	21,900.0			84,300.0				EOCR	EOCR construction was terminated 12/62. The facility was mothballed prior to operation.
Experimental Organic Cooled Reactor (DOE). INEL Site, ID				40,000.0				EOCR	Organic cooled and moderated. KE-AC
Heavy Water Components Test Reactor (DOE). SRL, Aiken, SC				61,100.0				HWCTR	Flour-Al moderated. Pressurized heavy water.
Homogeneous Reactor Experiment No. 1 (DOE). Oak Ridge, TN	140.0			1,000.0				Du Pont	Du Pont
Homogeneous Reactor Experiment No. 2 (DOE). Oak Ridge, TN	300.0			5,200.0				HRE-1	Aqueous homogeneous solution ( $UO_2SO_4$ ).
Los Alamos Molten Plutonium Reactor Experiment (DOE). Los Alamos, NM				1,000.0				ORNL	ORNL
Los Alamos Power Reactor Experiment No. 1 (DOE). Los Alamos, NM				2,000.0				LAMPRE-1	Fast molten plutonium fueled, sodium cooled. LANL
Los Alamos Power Reactor Experiment No. 2 (DOE). Los Alamos, NM				1,000.0				LAPRE-1	Aqueous homogeneous (phosphoric acid).
Molten Salt Reactor Experiment (DOE). Oak Ridge, TN				8,000.0				LAPRE-2	Aqueous homogeneous (phosphoric acid).
								LANL	LANL
								MSRE	Single region, graphite moderated. ORNL

Organic Moderated Reactor Experiment (DOE), INEL Site, ID	12,000.0	57 00	63 00	OMRE. Organic cooled and moderated. AI PRT. Pressure tube, heavy water moderated and cooled. WHC No Desg.	OMRE demonstrated the technical and economic feasibility of using liquid hydrocarbon terphenyls as coolant and/or moderator.	
Plutonium Recycle Test Reactor (DOE), Richland, WA	70,000.0	60 00	69 00	Plutonium. Pressure tube, heavy water moderated and cooled. WHC No Desg.		
Saxton Nuclear Experimental Reactor Project (DOE), Saxton, PA	3,000.0	23,500.0	62 00	72 00	Pressurized water. West. SRE. Sodium graphite. AI	Owner: Saxton Nuclear Experimental Corp.
Sodium Reactor Experiment (DOE), Santa Susana, CA	5,700.0	20,000.0	57 00	64 02	SRE operated at 20 MW(t) until shut down 2/64 for modification to permit an increase in power level to 30 MW(t). On 12/2/66, deactivation was announced. Owners: DOE and Southern California Edison Co.	
Southwest Experimental Fast Oxide Reactor (NRC), Stricker, AR	20,000.0	69 00	72 00	SEFOR. Sodium cooled, fast. GE UHTREX. Helium cooled. LANL VBR. Boiling water. GE	Owner: Southwest Atomic Energy Associates.	
Ultra High Temperature Reactor Experiment (DOE), Los Alamos, NM	3,000.0	68 00	70 00			
Vallecitos Boiling Water Reactor (NRC), Pleasanton, CA	5,000.0	57 00	63 12		Owner: General Electric Company and Pacific Gas & Electric Co.	

## B. Space Nuclear Auxiliary Power (SNAP)

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation.	Type. Principal nuclear contractor	Comment
SNAP-02 Developmental System (DOE), Santa Susana, CA					50.0	61 00	63 00	S2DS. NaK-cooled.		
SNAP-02 Experimental Reactor (DOE), Santa Susana, CA					50.0	59 00	60 00	AI		
SNAP-02/10A TSF Shielding Experiment (DOE), Oak Ridge, TN					10.0	67 00	73 00	SER. NaK-cooled.		
SNAP-08 Developmental Reactor (DOE), Santa Susana, CA					600.0	68 00	69 00	AI		
SNAP-08 Experimental Reactor (DOE), Santa Susana, CA					600.0	62 00	65 00	S8ER. NaK-cooled.		
SNAP-10A Flight System (DOE). In orbit, US	0.5	39.0	65 00	65 00	0.5	39.0	64 00	S10FS-4.	AI	S10FS-4 operated in orbit April–May 1965.
SNAP-10A Flight System (DOE). Oak Ridge, TN	0.5	39.0	(Spare)		0.5	39.0	64 00	AI		Operation terminated unexpectedly after 43 days at power, probably owing to a sequence of failures of electrical components of the spacecraft with resulting spurious commands shutting down the reactor. An identical ground test unit, S10FS-3, operated successfully for more than a year before being shut down in 1966.
SNAP-10A Flight System (DOE). Ground Test No. 1 (DOE).	0.5	39.0	64 00	64 00	0.5	39.0	64 00	AI		
SNAP-10A Flight System (DOE). Ground Test No. 3 (DOE). Santa Susana, CA	0.5	39.0	66 00	66 00	0.5	39.0	66 00	AI		See comment for SNAP-10 Flight System, S10FS-4.

## 2. EXPERIMENTAL POWER-REACTOR SYSTEMS

## PART I CIVILIAN REACTORS (DOMESTIC)

### C. Space Propulsion

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power net MW(e)	MD capacity net MW(t)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation. Type. Principal nuclear contractor	Comment
Fuel Element Test Bed (DOE). NRDS, NV				44,000.0		72.00	72.00		NF-1. Open cycle, gaseous hydrogen. LANL	
Fuel Element Test Reactor (DOE). NRDS, NV				514,000.0		Indef.	68.00		Pewee-1. Open cycle, liquid hydrogen. LANL	
Fuel Element Test Reactor (DOE). NRDS, NV				514,000.0		Indef.	73.00		Pewee-2. Open cycle, liquid hydrogen. LANL	
Ground Experimental Engine Experiment (DOE). NRDS, NV				1,100,000.0		Indef.	73.00		XE-Backup. Open cycle, liquid hydrogen. LANL	
Ground Experimental Engine Experiment (DOE). NRDS, NV				1,100,000.0		68.00	69.00		AG-West. XE-Prime. Open cycle, liquid hydrogen.	
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV				109,600.0		64.00	64.00		NRX-A2. Open cycle, liquid hydrogen.	
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV				1,100,000.0		65.00	65.00		AG-West. NRX-A3. Open cycle, liquid hydrogen.	
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV				1,120,000.0		66.00	66.00		AG-West. NRX-A5. Open cycle, liquid hydrogen.	
Nuclear Rocket Engine Reactor Experiment (NERVA) (DOE). NRDS, NV				1,199,000.0		67.00	67.00		AG-West. NRX-A6. Open cycle, liquid hydrogen.	
Nuclear Rocket Engine Reactor System Test (NERVA) (DOE). NRDS, NV				1,155,000.0		66.00	66.00		AG-West.. NRX-A4/EST.	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV				70,000.0		59.00	59.00		Open cycle, gaseous hydrogen. LANL	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV				85,000.0		60.00	60.00		Kiwi-A. Open cycle, liquid hydrogen AG-West.	
Nuclear Rocket Reactor Experiment (DOE). NRDS, NV				100,000.0		60.00	60.00		Kiwi-A. Open cycle, gaseous hydrogen. LANL	
									Kiwi-A-3. Open cycle, gaseous hydrogen. LANL	
									Nuclear Rocket Reactor Experiment (DOE). NRDS, NV	

Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	300,000.0	61 00	61 00	Kiwi-B1A. Open cycle, gaseous hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	900,000.0	62 00	62 00	Kiwi-B1B. Open cycle, liquid hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	500,000.0	62 00	62 00	Kiwi-B4A.. Open cycle, liquid hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	1,000,000.0	64 00	64 00	Kiwi-B4D. Open cycle, liquid hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	950,000.0	64 00	64 00	Kiwi-B4E. Open cycle, liquid hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	1,070,000.0	65 00	65 00	Phoebus 1A. Open cycle, liquid hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	1,400,000.0	67 00	67 00	Phoebus 1B. Open cycle, liquid hydrogen. LANL
Nuclear Rocket Reactor Experiment (DOE), NRDS, NV	4,200,000.0	68 00	68 00	Phoebus 2A. Open cycle, liquid hydrogen. LANL

## 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### A. General Irradiation Test

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation. Type. Principal nuclear contractor	Comment
Engineering Test Reactor (DOE), INEL, ID	175,000.0					57 00	81 00	ETR. Tank KE-GE.	Reactor was shut down in 1973 for modifications and insertion of Sodium Loop Safety Facility (SLSF) loop. Operation resumed in 1975. Deactivated in 1981 and no longer operable.
Fast Flux Test Facility (DOE), Hanford Site, WA	291,000.0					80 02	93 12	FFTF. Sodium cooled, loop, WHC	The Fast Flux Test Facility initiated shutdown activities 12/93.
General Electric Testing Reactor (NRC), Pleasanton, CA	50,000.0					58 00	77 00	GETR. Tank. Owner.	In August 1958 the MTR was operated with an experimental plutonium core at power levels up to 30,000 kW(t). It demonstrated the ability of plutonium fuel elements to perform satisfactorily in a high-flux research or test reactor. Operation as a test reactor was terminated 6/30/69, and a Plutonium-240 (Phoenix) core was run in FY 1970.
Materials Testing Reactor (DOE), INEL, ID	40,000.0					52 00	70 00	MTR. Tank. ORNL-ANL-Blaw-Knox	Reactor was decommissioned in 1974.
Plum Brook Reactor Facility (NRC), Sandusky, OH	60,000.0					61 00	74 00	NASA-TR. Tank. NASA	
Westinghouse Testing Reactor (NRC), Waltz Mill, PA	60,000.0					59 00	62 00	WTR. Tank. Owner	

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### B. High-Power Research and Test

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation. Type: Principal nuclear contractor	Comment
Ames Laboratory Research Reactor (DOE), Ames, IA	5,000.0				65 00	77 00		ALRR. Heavy water. AMF	
Argonne Research Reactor (DOE). Argonne, IL	5,000.0				54 00	79 00		CP-5. Heavy. water. ANL	
Babcock & Wilcox Nuclear Development Center Test Reactor (NRC), Lynchburg, VA	6,000.0				64 00	71 00		BAWTR. Pool. Owner	
Cintichem, Inc. Reactor (NRC). Sterling Forest, NY	5,000.0				61 00	90 00		CINR. Pool. AMF	Being decommissioned.
Industrial Reactor Laboratories, Inc. (NRC), Plainsboro, NJ	5,000.0				58 00	75 00		IRL. Pool. AMF	
Oak Ridge Research Reactor (DOE), Oak Ridge, TN	30,000.0				58 00	87 00		ORR. Tank. ORNL	Shut down—Defueled.
Sandia Engineering Reactor (DOE), Kirtland AFB, NM	5,000.0				61 00	70 00		SER. Tank. Sandia	

#### C. Safety Research and Test

King Intense Neutron Generator (DOE), Los Alamos, NM	72 00	77 00	Kinglet. Homogeneous. LANL	Transient.
Kiwi-Transient Test Reactor (DOE), NRDS, NV	65 00	65 00	Kiwi-TTR. LANL	
Loss of Fluid Test (DOE). INEL, ID	55,000.0	78 00	85 07	LOFT. Pressurized water. EG&G-ID
Power-Burst Facility (DOE). INEL, ID	28,000.0	73 00	92 00	PBE. Open tank. EG&G-ID
SNAP-10A Transient Test No. 2 (DOE), INEL, ID	65 00	66 01	SNAPTRAN-2. Be-reflected SNAP-10A. Al-PPC	The SNAPTRAN series of experiments was designed to develop, in a land-based environment, safety information on space auxiliary power reactors through excursion testing at various temperatures and rates of reactivity insertion. The destructive experiments approach the maximum credible accidents postulated for SNAP reactor systems. SNAPTRAN-1 was convened to SNAPTRAN-2 for destructive testing 1/66.

SNAP-10A Transient Test No. 3 (DOE), INEL, ID	64 00	64 00	SNAPTRAN-3. H <sub>2</sub> O-reflected SNAP-10A.
Special Power Excursion Reactor Test No. 1 (DOE), INEL, ID	55 00	64 00	SPERT-1. Open tank. PPC
Special Power Excursion Reactor Test No. 2 (DOE), INEL, ID	60 00	65 00	SPERT-2. Pressurized water. PPC
Special Power Excursion Reactor Test No. 3 (DOE), INEL, ID	58 00	68 00	SPERT-3. Pressurized water. PPC
Special Power Excursion Reactor Test No. 4 (DOE), INEL, ID	62 00	70 00	SPERT-4. Pool. INC

## D. General Research

Accelerator Pulsed Fast Critical Assembly (DOE), La Jolla, CA	1.0	67 00	APFA-III. Fast. GA	The APFA-III was previously operated as the KUKLA Prompt Critical Assembly at Lawrence Livermore National Laboratory at Livermore, CA.
American Standard Inc. (NRC), Mountain View, CA	58 00	60 00	UTR-1. Graphite/water. AS, Inc.	This reactor was shipped abroad for exhibition purposes in the USAEC Atoms for Peace Exhibit in the Tokyo International Trade Fair in 1959, and in Cairo, Egypt, and Lahore, Pakistan, in 1960.
Annular Core Pulsed Reactor (DOE), Kirtland AFB, East, NM	67 00	77 00	ACPR. U-Zr. hydride. GA	In 1977 the Annular Core Pulsed Reactor (ACPR) was shut down. After replacement of fuel and other modifications, the unit was renamed the Annular Core Research Reactor.
Argonne CP-3, rebuilt as CP-3' (DOE), Palos Park, IL	300.0	44 00	CP-3'. Heavy water. Met. Lab.	
Argonne Low Power Research Reactor (DOE), Argonne, IL	250.0	62 00	Juggernaut. Graphite/water. ANL	After the assembly and operation of this reactor in the government exhibit at Geneva in 9/58, it was dismantled and returned to ANL, where it was rebuilt as a 250-kW(t) Juggernaut.
Argonne National Laboratory (DOE), Argonne, IL	57 00	72 00	AGN-201-108. Homog. solid. AGN	
Argonne Nuclear Assembly for University Training (DOE), Argonne, IL	10.0	57 00	Argonaut (CP-11). Graphite/water. ANL	
Argonne Thermal Source Reactor (DOE), Argonne, IL	10.0	57 00	ATSR. Thermal. ANL	
Atomics International (NRC), Canoga Park, CA	1,000.0	58 00	L-47. Homogeneous. AI LRP. Pool. Owner	
Babcock & Wilcox Lynchburg Pool Reactor (NRC), Lynchburg, VA	2,000.0	56 00	BRR. Pool. AMF	
Battelle Memorial Institute (NRC), West Jefferson, OH	200.0	64 00	JANUS. Tank. ANL	
Biological Research Reactor (DOE), Argonne, IL	20,000.0	50 00	BGRR. Air cooled, graphite mod- erated. AU, Inc.	
Brookhaven Graphite Research Reactor (DOE), Upton, NY				

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### D. General Research (Continued)

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation. Type. Principal nuclear contractor	Comment
Brookhaven Neutron Source Reactor No. 1 (DOE). Upton, NY	100.0				58.00	70.00		SCHIZO. Tank. AU, Inc.	
Brookhaven Neutron Source Reactor No. 2 (DOE). Upton, NY	100.0				65.00	70.00		PHRENIC. Tank. AU, Inc.	
Bulk Shielding Reactor (DOE). Oak Ridge, TN	2,000.0				50.00	91.00		BSR. Pool. ORNL	Shut down—Defueled.
Chicago Pile 1, rebuilt as CP-2 (DOE). Chicago, IL	0.2				42.00	54.00		CP-2. Graphite. Met. Lab.	In 1943 Manhattan Engineer District disassembled Chicago Pile 1 and rebuilt at Palos Park, IL, as Chicago Pile 2. CP-2 had a thermal-power level of 10 kW.
Curtiss-Wright Nuclear Research Laboratory of the Commonwealth of Pennsylvania (NRC). Quehanna, PA	1,000.0				58.00	66.00		CWRR. Pool. Owner	
DOE Demonstration Reactor (DOE). Oak Ridge, TN	10.0				69.00	69.00		Demo Reac. Pool. Lockheed	This reactor was formerly called the Latin American Demonstration Reactor and was operated initially in São Paulo, Brazil, 10/69. It is currently in storage at Oak Ridge.
European-Asian Exhibit Program (DOE). Oak Ridge, TN	10.0				63.00	69.00		EAEP. Pool. Lockheed	This reactor was operated in the USAEC Atoms for Peace Exhibit in Vienna, Austria, 6/63; Belgrade, Yugoslavia, 9/63; Madrid, Spain, 4/64; Lisbon, Portugal, 4/65; Utrecht, Netherlands, 3/66; Dublin, Ireland, 9/66 to 10/66; Ankara, Turkey, 4/67 to 5/67; Tehran, Iran, 11/67 to 12/67; Taipei, Taiwan, 4/68 to 5/68; Seoul, Korea, 9/68 to 10/68; Manila, Philippines, 2/69 to 3/69; and Bucharest, Romania, 10/69.
Fast Neutron Source Reactor (DOE). Upton, NY	1.0				67.00	70.00		BNL/FS-1. Fast. BNL	
Fast-Source Reactor (DOE). INEL Site, ID	50.0				59.00	93.00		TRIGA-Mk II. U-Zr hydride. Owner	This TRIGA-Mk II was operated at the New Delhi World Agricultural Fair in 1960. It was dismantled for storage in California by Chevron USA Corporation. Owner: World Agricultural Fair-U.S. Exhibit Reactor.
Health Physics Research Reactor (DOE). Oak Ridge, TN	10.0				62.00	91.00		HPRR. Fast burst. ORNL	
High Temperature Lattice Test Reactor (DOE). Richland, WA	2.0				67.00	71.00		HTLTR. Graphite moderated. PNL	Shut down—Defueled.

Illinois Institute of Technology Research Institute (DOE). Chicago, IL	75.0	56 00	67 00	ARR (L-54). Homogeneous. AI	Owner: Armour Research Foundation.
Kinetic Experiment on Water Boilers (NRC). Santa Susana, CA	0.5	56 00	67 00	KEWB. Homogeneous. AI	The KEWB reactor was operated by AI from 1956 to 1967 as the Kinetic Experiment on Water Boilers. Owner: Rockwell International. No power listed: transient.
Livermore Pool Type Reactor (DOE). Livermore, CA	3,000.0	57 00	80 00	LPTR. Tank. FW	
Livermore Water Boiler (DOE). Livermore, CA	0.5	53 00	61 00	LIWB. Homogeneous. AI	
Lockheed Aircraft Corp. (NRC). Dawsonville, GA	25.0	46 00	53 00	No Desg. Pool. Lockheed Clementine. Fast, plutonium fuel, mercury cooled. LANL	
Los Alamos Fast Reactor (DOE). Los Alamos, NM	5.5	44 00	44 00	LOPO. Homogeneous. LANL	
Los Alamos LOPO Reactor (DOE). Los Alamos, NM	25.0	44 00	50 00	HYPO. Homogeneous. LANL	
Los Alamos Water Boiler (DOE). Los Alamos, NM	2.0	50 00	74 00	SUPO. Homogeneous. LANL	
Los Alamos Water Boiler (DOE). Los Alamos, NM	2.0	65 00	66 00	SNARE. Pool. Sandia	In 1965 and 1966 this reactor operated at Sandia, NM, as SNARE. Prior to that time it was operated at INEL as the Shield Test Pool Reactor (SUSIE) in the Aircraft Nuclear Propulsion Program from 1959 to 1962. It was shut down in 1966 and transferred to Louisiana State University 6/66, where it was never assembled. Owner: Phillips Petroleum Co.
Louisiana State University Nuclear Science Center (DOE). Baton Rouge, LA	3,000.0	50 00	68 00	LJTR. Tank. ORNL	
Low Intensity Test Reactor (DOE). Oak Ridge, TN	100.0	86 00	91 00	LTNIF. Pool. ORNL	
Low Temperature Neutron Irradiation Facility (DOE). Oak Ridge, TN	250.0	63 00	73 00	MUR. LWR. Lockheed NRF. U-Zr hydride. WHC	
NASA Mock-Up Reactor (NRC). Sandusky, OH	100.0	77 00	90 00		The Neutron Radiography Facility was used to perform neutron radiography of reactor fuel pins. The reactor was shut down in 1989 and has been converted to a fuel storage basin.
Neutron Radiography Facility (DOE). Hanford Site, WA	100.0	63 00	86 00	TRIGA-Mk F. U-Zr hydride. GA	Owner: Space Radiation Laboratory. This TRIGA reactor was capable of being pulsed and of steady-state operation.
Northrop Corporate Laboratories (NRC). Hawthorne, CA	62 00	70 00	FRAN. Prompt burst. LLNL/PPC	Until mid-1967 FRAN was operated by LLNL at the Nevada Test Site, and until 1970 it was operated in the former ML-1 reactor area at INEL. In mid-1970 it was transferred back to LLNL. Fuel was removed for processing.	
Nuclear Effects Reactor (DOE). NTS, NV	59 00	64 00	KUKLA. Prompt burst. LLNL		
Nuclear Effects Reactor (DOE). San Diego, CA					

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

### PART I CIVILIAN REACTORS (DOMESTIC)

#### D. General Research (Continued)

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power net MW(e)	MD capacity MW(t)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation. Type: Principal nuclear contractor	Comment
Nuclear Examination Reactor (NRC), Santa Susana, CA	3.0			52.00	80.00		L-85 (AE-6).		Homogeneous. AI	Ownership of this reactor was transferred to North American Rockwell 12/71 and was redesignated the Nuclear Examination Reactor or L-85 rather than AE-6. The AE-6, also designated WBNS, was built and first operated at Downey, CA. It was moved to Santa Susana in 1956.
Oak Ridge Graphite Reactor (DOE), Oak Ridge, TN	3,500.0			43.00	63.00		ORG. Graphite. CL			
Pawling Research Reactor (NRC), Pawling, NY				58.00	71.00		PRR. LWR. UNC			Owner: United Nuclear Corp.
Physical Constants Test Reactor (DOE), Richland, VA	0.1			55.00	72.00		PCTR. Graphite. PNL			
Radiation Effects Reactor (NRC), Dawsonville, GA	3,000.0			58.00	70.00		RER. Pool. Lockheed			The RER was previously used in the terminated Aircraft Nuclear Propulsion Program. A license authorizing Lockheed to operate the reactor as a commercial facility was issued 7/62, and 8/62 the USAF transferred the facility to the General Services Administration. Lockheed acquired the title to the facility 3/65.
Rockwell International (NRC). Canoga Park, CA				58.00	74.00		L-77. Homogeneous. AI			
Sandia Pulsed Reactor (DOE), Kirtland AFB, East, NM				61.00	67.00		SPR. Prompt burst. Sandia			
Shield Test and Irradiation Reactor (DOE), Santa Susana, CA	1,000.0			61.00	72.00		STIR. Pool. AI			This reactor was previously designated STF for SNAP Shield Test Facility.
Thermal Test Reactor No. 2 (DOE), Richland, WA	0.1			55.00	72.00		TTR-2. Graphite. PNL			
Torrey Pines, TRIGA-Mk III Reactor (NRC), La Jolla, CA	1,500.0			66.00	73.00		TRIGA-Mk III. U-Zr			Owner: General Atomic.
Tower Shielding Reactor (DOE), Oak Ridge, TN	500.0			54.00	58.00		TSR. BSR-type in tank. ORNL			
Tower Shielding Reactor No. II (DOE), Oak Ridge, TN	1,000.0			60.00	92.00		TSR-2. Light water. ORNL			Shut down—To be defueled.
UTR Test Reactor (NRC), Mountain View, CA				61.00	63.00		No Desg. Graphite/water. Owner			Owner: American Radiator & Standard Sanitary Corp.
Westinghouse Nuclear Training Center (NRC), Zion, IL	10.0			72.00	87.00		WNTR. Tank. West.			

## E. University Research and Teaching

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation. Type. Principal nuclear contractor	Comment
Brightman Young University (NRC), Provo, UT									
California Polytechnic State University (NRC), San Luis Obispo, CA									
California, Berkeley, University of (NRC), Berkeley, CA	1,000.0			1,000.0		67 00	87 00	L-77. Homogeneous. AI AGN-201-100.	California Polytechnic State University received a permit in 12/71 to relocate AGN-201-100 and operate it on the uni- versity's campus. The unit was previously operated starting in 1956 at the Naval Postgraduate School, Monterey, CA. In 1980, AGN-201-100 was shut down and decommissioned.
California, Los Angeles, University of, School of Engineering and Applied Science (NRC), Los Angeles, CA	100.0			100.0		73 00	80 00	Homog. solid. AGN	
California, Santa Barbara, University of (NRC), Santa Barbara, CA						66 00	87 12	TRIGA-Mk III. U-Zr hydride. GA	
Catholic University of America (NRC), Washington, DC						60 00	84 00	Educator. Graphite/water. AMF	
Colorado State University (NRC), Fort Collins, CO						74 00	86 00	L-77. Homogeneous. AI AGN-201-101. Homog. solid. AGN	
Columbia University (NRC), New York, NY	250.0			250.0		57 00	86 00	AGN-201-109. Homog. solid. AGN	The Columbia University TRIGA-Mk II was licensed to operate by NRC. However, the City of New York has not authorized operation. Therefore Columbia University has not procured fuel. The license was terminated in 1985.
Delaware, University of (NRC), Newark, DE						58 00	78 00	AGN-201-113. Homog. solid. AGN	
Georgia Institute of Technology (NRC), Atlanta, GA						68 00	85 00	AGN-201-104. Homog. solid. AGN	AGN-201-104 operated at the University of Akron (Ohio) from 1957 until transferred to the Georgia Institute of Technology in 1967. Operations at that facility began in 1968. Decommissioning of AGN-201-104 was achieved in 1986.

### 3. TEST, RESEARCH, AND UNIVERSITY REACTORS

## PART I CIVILIAN REACTORS (DOMESTIC)

## E. University Research and Teaching (Continued)

Name (Regulatory agency). Location	Power capacity net kW(e)	Power licensed kW(t)	Authorized power kW(t)	Power MD capacity net MW(e)	Power licensed MW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Designation. Type. Principal nuclear contractor	Comment
Kansas, University of (NRC). Lawrence, KS Leland Stanford University (NRC). Palo Alto, CA Memphis State University (NRC). Memphis, TN	250.0 10.0		61.00 59.00 77.00	87.00 74.00 85.00	Model 4180. Pool. BAC No Desg. Pool. GE			License terminated 10/5/93.	
Michigan State University (NRC). East Lansing, MI	2500		69.00	89.00	'TRIGA-Mk I. U-Zr hydride. GA			The core of the Michigan State University reactor operated in the University of ILL TRIGA facility from 1960 until trans 1968. The reactor has been decommissioned. The license was terminated 4/5/90.	
Mississippi State University (NRC). State College, MS			RRR. Homogeneous. Owner: NSA		This reactor was originally operated by Carolina State University as the Raleigh Research Reactor (RRR). It was transferred to Mississippi State University for reactivation. The RRR was dismantled in 1963. Owing to funding problems the reactor was never activated. Late in 1966 it was shipped to Barnwell, SC, for dismantling.				
Nevada, University of (NRC). Reno, NV	10.0		63.00 60.00	74.00 73.00	L-77. Homogeneous. AI No Desg. Graphite/water.				
North Carolina State University (NRC). Raleigh, NC			58.00	88.00	Cook AGN-211-102.				
Oklahoma, University of (NRC). Norman, OK			58.00	74.00	Homog. solid, pool. AGN AGN-201-114.				
Oregon State University (NRC). Corvallis, OR			67.00	74.00	Homog. solid. AGN AGN-201M-105.				
Polytechnic Institute of New York (NRC). New York, NY			59.00	79.00	Homog. solid. AGN				
Puerto Rico Nuclear Center DOE). Mayagüez, PR			72.00	76.00	TRIGA-FLIP. Pool-TRIGA core. GA				
Puerto Rico Nuclear Center (DOE). Mayagüez, PR			2,000.0						

Texas at Austin, University of (NRC). Austin, TX	250.0	63 00	91 00	TRIGA-Mk I. U-Zr hydride. GA	License terminated 10/13/93.
Tuskegee Institute (NRC). Tuskegee, AL		74 00	84 12	AGN-201-102. Homog. solid. AGN	AGN-201-102 was operated at Oklahoma State University, Stillwater, OK, from 1957 until transferred to Tuskegee Institute in 1972; there it was licensed to operate but was never started up. Tuskegee Institute returned the fuel to the Department of Energy, and the operating license was terminated 10/12/84.
Utah, University of (NRC). Salt Lake City, UT		57 00	91 00	AGN-201-107. Homog. solid. AGN	Being decommissioned.
Virginia, University of (NRC). Charlottesville, VA		74 00	91 00	CAVALIER. Reactor type not specified. Owner	Being decommissioned.
Virginia Polytechnic Institute (NRC). Blacksburg, VA	100.0	59 00	84 00	UTR-10. Graphite/water. AS Inc.	Decommissioning plan has been submitted to NRC.
Washington, University of (NRC). Seattle, WA		61 00	90 00	Educator. Graphite/water. AMF	
West Virginia University (NRC). Morgantown, WV		59 00	72 00	AGN-211-103. Homog. solid, pool. AGN	
William Marsh Rice University (NRC). Houston, TX		59 00	65 00	AGN-211-101. Homog. solid, pool. AGN	
Wyoming, University of (NRC). Laramie, WY		59 00	74 00	L-77. Homogeneous. AI	

## 1. MATERIALS PRODUCTION

Name (all owned by DOE)	Designation	Location	Nuclear designer	Type	Authorized power kW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Comment
B Reactor	B Reactor	Richland, WA	Du Pont	Graphite	44 00	68 00		
C Reactor	C Reactor	Richland, WA	GE	Graphite	52 00	69 00		
C Reactor	C Reactor	Aiken, SC	Du Pont	Heavy water	55 00	93 00		
D Reactor	D Reactor	Richland, WA	Du Pont	Graphite	44 00	67 00		
DR Reactor	DR Reactor	Richland, WA	GE	Graphite	50 00	64 00		
F Reactor	F Reactor	Richland, WA	Du Pont	Graphite	45 00	65 00		
H Reactor	H Reactor	Richland, WA	GE	Graphite	49 00	65 00		
KE Reactor	KE Reactor	Richland, WA	GE	Graphite	55 00	71 00		
KW Reactor	KW Reactor	Richland, WA	GE	Graphite	55 00	70 00		
L Reactor	L Reactor	Aiken, SC	Du Pont	Heavy water	54 00	93 00		
P Reactor	P Reactor	Aiken, SC	Du Pont	Heavy water	54 00	93 00		
R Reactor	R Reactor	Savannah River Plant, Aiken, SC	Du Pont	Heavy water	53 00	64 00		

## PART II PRODUCTION REACTORS

## 2. PROCESS DEVELOPMENT

## PART II PRODUCTION REACTORS

Name (all owned by DOE)	Designation	Location	Nuclear designer	Type	Authorized power kW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Comment
Hanford 305 Test Reactor	HTR	Richland, WA	Du Pont	Graphite	44.00	76.00		
Lattice Test Reactor	LTR	Savannah River Plant, Aiken, SC	Du Pont	Heavy water	1.0	67.00	79.00	Negligible power.
Process Development Pile	PDP	Savannah River Plant, Aiken, SC	Du Pont	Heavy water	1.0	53.00	79.00	
SR 305-M Test Pile	Test Pile	Savannah River Plant, Aiken, SC	Du Pont	Graphite	1.0	53.00	83.00	SR 305-M Test Pile was used to measure the reactivity effects of components (fuel tubes, target tubes, control rods, etc.) prior to use in Savannah River (SR) reactors. In addition, the Test Pile was used to measure the neutron absorption of miscellaneous materials used at SR. The Test Pile has been dismantled. The SP—an enriched uranium-fueled, graphite-moderated, water-cooled reactor—supplied neutrons for reactor-component-reactivity testing in the SE, which was a graphite chamber on top of the SP. Authorized power ranged from 2 to 10 kW(t).

Name (all owned by DOE)	Designation	Location	Nuclear designer	Type	Authorized power kW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Comment
Standard Pile/ Subcritical Experimental Complex	SP/SE	Savannah River Laboratory, Aiken, SC	Du Pont	Graphite	2.0	53.00	79.00	

## 1. DEFENSE POWER-REACTOR APPLICATIONS

### A. Remote Installations

Reactors in the Army Power Program are designated to reflect mobility characteristics, power range, development sequence, and field sequence. The first capital letter indicates mobility characteristics: S (stationary operation), not designed for subsequent relocation; P (portable), semimobile, stationary operation, capable of being dismantled and reassembled for use in successive locations; and M (mobile), capable of being moved intact, or virtually intact, for use in successive locations. The second capital letter

indicates the power range as measured by design capacity for continuous operation: L (low) 100 to 1000 kW(e); M (medium), 1000 to 10,000 kW(e); and H (high), 10,000 kW(e) or more. Arabic numerals indicate order in which plants having the same mobility and power characteristics are initiated. If not followed by an additional letter, the designation indicates a prototype or pilot plant. The last capital letter (when present) indicates the alphabetical order in which field plants of a specific type are initiated.

Name (all owned by DOE).	Designation	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Comment
Location						
Portable Medium Power Plant, No. 1, Sundance, WY	PM-1	1,000.0	9,370.0	62.00	68.00	Martin. Pressurized water.
Portable Medium Power Plant, No. 2A, Camp Century, Greenland	PM-2A	1,560.0	10,000.0	60.00	63.00	Alco. Pressurized water.

## PART III MILITARY REACTORS

The PM-2A was shut down 7/9/63 and dismantled during 4/64 to 6/64. The reactor vessel was then used by INTEL for NDT (nil ductility transition temperature) investigations of materials that had been subjected to long-term irradiation. Defects were sequentially introduced into the vessel wall during a series of tests involving pressure and temperature conditions which exceeded the range permitted in operating nuclear power plants. The final test on 11/18/66 resulted in a brittle fracture under conditions even more severe than those which had been previously predicted to cause failure. The test program confirmed laboratory data on the adequacy of reactor-operating limitations to prevent brittle fracture of a pressure vessel.

Portable Medium Power Plant,  
No. 3A. McMurdo Sound, Antarctica  
Stationary Medium Power Plant  
No. 1. Fort Belvoir, VA  
Stationary Medium Power Plant  
No. 1A. Fort Greely, AK

PM-3A 1,500.0 9,510.0 62 00 73 00 Martin.  
Pressurized water.  
Alco.  
Pressurized water.  
Alco.  
Pressurized water.  
Alco.  
Pressurized water.

SM-1 1,855.0 10,000.0 57 00 73 00 Martin.  
Pressurized water.  
Alco.  
Pressurized water.  
Alco.  
Pressurized water.

SM-1A 1,650.0 20,200.0 62 00 72 00 Martin.  
Pressurized water.  
Alco.  
Pressurized water.  
Alco.  
Pressurized water.

STURGIS Floating Nuclear Power  
Plant

MH-1A 10,000.0 45,000.0 67 00 76 00 Martin.  
Pressurized water.

The Army made the determination to shut down the SM-1A because the plant's demonstration and R&D missions had been successfully completed and because of the ready availability of cheaper conventional power at the site.

The MH-1A was installed in the STURGIS (formerly the Liberty Ship CHARLES H. CUGLE) at Mobile, AL. Acceptance testing was performed at Fort Belvoir, VA, 4/67 to 6/27/67, when the Army accepted the plant from the contractor. In late 7/68 the plant was deployed to Gatun Lake, Panama Canal Zone, and began producing power to the Panama Canal power grid on 10/5/68. The MH-1A is no longer available for service.

## B. Propulsion (Naval)

SSN, Submarine (Nuclear Propulsion).

SSBN, Fleet Ballistic Missile Submarine (Nuclear Propulsion).

CGN, Guided Missile Cruiser (Nuclear Propulsion).

Name (all owned by U.S. Navy)	Designation	Shipbuilder	Start-up	Shut-down	Comment
NAUTILUS	SSN571	Electric Boat (Groton)	54 00	80 00	
SEAWOLF PWR	SSN575	Electric Boat (Groton)	60 00	86 00	
SEAWOLF Sodium Reactor	SSN575	Electric Boat (Groton)	57 00	59 00	The SEAWOLF, originally commissioned with a sodium-cooled reactor in 3/57, was recommissioned with a pressurized-water reactor on 9/30/60.
SKATE	SSN578	Electric Boat (Groton)	57 00	85 00	
SWORDFISH	SSN579	Portsmouth	58 00	87 00	
SARGO	SSN583	Mare Island	58 00	86 00	
SEADRAGON	SSN584	Portsmouth	59 00	83 00	
SKIPJACK*	SSN585	Electric Boat (Groton)	58 00	89 00	
TRITON (2 Reactors)	SSN586	Electric Boat (Groton)	59 00	68 00	
HALIBUT	SSN587	Mare Island	59 00	76 00	
SCAMP*	SSN588	Mare Island	61 00	87 00	
SCORPION	SSN589	Electric Boat (Groton)	60 00	68 00	
SCUPPIN	SSN590	Ingalls	61 00	89 00	
SHARK*	SSN591	Newport News	60 00	89 00	
SNOOK*	SSN592	Ingalls	61 00	86 00	
THRESHER	SSN593	Portsmouth	61 00	63 00	
PERMIT*	SSN594	Mare Island	62 00	90 00	
PLUNGER*	SSN595	Mare Island	62 00	89 00	
BARB*	SSN596	Ingalls	63 00	89 00	
TULLIBEE	SSN597	Electric Boat (Groton)	60 00	87 00	
GEORGE WASHINGTON*	SSN598	Electric Boat (Groton)	59 00	84 00	
PATRICK HENRY*	SSN599	Electric Boat (Groton)	60 00	83 00	
THEODORE ROOSEVELT*	SSBN600	Mare Island	60 00	81 00	
ROBERT E. LEE*	SSN601	Newport News	60 00	83 00	
ABRAHAM LINCOLN*	SSBN602	Electric Boat (Groton)	60 00	81 00	
POLLACK*	SSN603	NYSC	63 00	88 00	
HADDO*	SSN604	NYSC	64 00	90 00	
JACK*	SSN605	Portsmouth	65 00	89 00	

## 1. DEFENSE POWER-REACTOR APPLICATIONS

## PART III MILITARY REACTORS

### B. Propulsion (Naval) (Continued)

Name (all owned by U.S. Navy)	Designation	Shipbuilder	Start-up	Shut-down	Comment
TINOSA*	SSN606	Portsmouth	63 00	91 00	
DACE*	SSN607	Ingalls	63 00	88 00	
ETHAN ALLEN*	SSN608	Electric Boat (Groton)	61 00	82 00	
SAM HOUSTON*	SSN609	Newport News	61 00	91 00	
THOMAS A. EDISON*	SSN610	Electric Boat (Groton)	61 00	83 00	
JOHN MARSHALL*	SSN611	Newport News	62 00	92 00	
GUARDFISH*	SSN612	NYSC	66 00	91 00	
FLASHER*	SSN613	Electric Boat (Groton)	66 00	91 00	
GREENLING	SSN614	GD (Quincy)	67 00	93 00	
LAFAYETTE*	SSBN616	Electric Boat (Groton)	63 00	91 00	
ALEXANDER HAMILTON*	SSBN617	Electric Boat (Groton)	63 00	92 00	
THOMAS JEFFERSON*	SSN618	Newport News	62 00	84 00	
ANDREW JACKSON	SSBN619	Mare Island	63 00	88 00	
JOHN ADAMS*	SSBN620	Portsmouth	64 00	88 00	
HADDOCK	SSN621	Ingalls	67 00	92 00	
JAMES MONROE*	SSBN622	Newport News	63 00	90 00	
NATHAN HALE*	SSBN623	Electric Boat (Groton)	63 00	86 00	
WOODROW WILSON	SSBN624	Mare Island	63 00	93 00	
HENRY CLAY	SSBN625	Newport News	63 00	90 00	
JAMES MADISON	SSBN627	Newport News	64 00	92 00	
TECUMSEH	SSBN628	Electric Boat (Groton)	64 00	93 00	
DANIEL BOONE	SSBN629	Mare Island	63 00	93 00	
JOHN C. CALHOUN	SSBN630	Newport News	64 00	93 00	
ULYSSES S. GRANT*	SSBN631	Electric Boat (Groton)	64 00	92 00	
VON STEUBEN	SSBN632	Newport News	64 00	93 00	
CASIMIR PULASKI	SSBN633	Electric Boat (Groton)	64 00	93 00	
NATHANAEL GREENE	SSBN636	Portsmouth	64 00	86 00	
BENJAMIN FRANKLIN	SSBN640	Electric Boat (Groton)	65 00	93 00	
GEORGE BANCROFT	SSBN643	Electric Boat (Groton)	65 00	93 00	
LEWIS AND CLARK	SSBN644	Newport News	65 00	91 00	
QUEENFISH*	SSN651	Newport News	66 00	90 00	
RAY	SSN653	Newport News	67 00	92 00	
GEORGE C. MARSHALL*	SSBN654	Newport News	66 00	92 00	
HENRY L. STIMSON	SSBN655	Electric Boat (Groton)	66 00	92 00	
GEORGE WASHINGTON	SSBN656	Newport News	66 00	92 00	
CARVER*	SSBN657	Electric Boat (Groton)	66 00	93 00	
FRANCIS SCOTT KEY	SSBN659	Electric Boat (Groton)	67 00	92 00	
WILL ROGERS	SSN661	Newport News	67 00	91 00	
LAPON	SSN664	Newport News	68 00	91 00	
SEA DEVIL	SSN665	Mare Island	72 00	91 00	
GUITARRO*	SSN685	Electric Boat (Groton)	74 00	90 00	
GLENARD P. LIPSCOMB*	SSN687	Newport News	74 00	93 00	
RICHARD B. RUSSELL	SSN689	Newport News	77 00	93 00	
BATON ROUGE	CGN39	Newport News	77 00	93 00	
TEXAS (2 reactors)					

\*The defueled reactor compartment has been removed and placed in a government burial ground.

## 2. DEVELOPMENTAL POWER

### A. Electric-Power Experiments and Prototypes

Name (owner). Location	Designation	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Reactor type. Principal nuclear contractor	Comment
Gas Cooled Reactor Experiment (DOE). INEL Site, ID	GCRE		2,200.0	60 00	62 00	Gas cooled, light water moderated. AGN	No electricity was produced.
Mobile Low Power Plant No. 1 (DOE). INEL Site, ID	ML-1	300.0	3,300.0	61 00	65 00	Gas cooled, light water moderated. AGN	
Stationary Low Power Plant No. 1 (DOE). INEL Site, ID	SL-1	300.0	2,200.0	58 00	61 00	Boiling water. ANL	

### B. Propulsion Experiments and Prototypes

Aircraft Reactor Experiment (DOE). Oak Ridge, TN	ARE	1,500.0	54 00	54 00	Molten salt. ORNL
Experimental Propulsion Test Reactor (DOE). NTS, NV	TORY IIA	150,000.0	60 00	61 00	Air cooled. LLNL
Experimental Propulsion Test Reactor (DOE). NTS, NV	TORY IIC	600,000.0	64 00	64 00	Air cooled. LLNL
Heat Transfer Reactor Experiment No. 1 (DOE). INEL Site, ID	HTRE-1	20,000.0	56 00	57 00	Air cooled. ANPD
Heat Transfer Reactor Experiment No. 2 (DOE). INEL Site, ID	HTRE-2	14,000.0	57 00	61 00	Air cooled. ANPD
Heat Transfer Reactor Experiment No. 3 (DOE). INEL Site, ID	HTRE-3	32,000.0	58 00	61 00	Air cooled. ANPD
Small Submarine Reactor Prototype (DOE). Windsor, CT	SIC		59 00	93 00	Pressurized water. GE
Submarine Advanced Reactor Prototype (DOE). West Milton, NY	S3G		58 00	91 00	Pressurized water. GE
Submarine Intermediate Reactor Mark A (DOE). West Milton, NY	SIG		55 00	57 00	Sodium. GE
Submarine Thermal Reactor Facility (DOE). INEL Site, ID	S1W		53 00	89 10	Pressurized water. West.

## 3. TEST AND RESEARCH

### A. Test

Aerospace Systems Test Reactor (USAFA). Fort Worth, TX	ASTR	10,000.0	54 00	71 00	LWR. Convair
Ground Test Reactor (USAFA). Fort Worth, TX	GTR	10,000.0	53 00	73 00	Pool. Convair
Nuclear Engineering Test Reactor (USAFA). Dayton, OH	NETR	10,000.0	65 00	70 00	Tank. Maxon-AC

Defueled in 1971; decommissioning began in 1973 and was completed in 1974.  
Decommissioning began in 1973 and was completed in 1974.

### 3. TEST AND RESEARCH

### PART III MILITARY REACTORS

#### B. Research

Name (owner).	Power capacity net kW(e)	Authorized power kW(t)	Initial criticality (yr mo)	Shut down (yr mo)	Reactor type.	Principal nuclear contractor	Comment
Location	Designation						
Army Materials Research Reactor (USA). Regulated by NRC. Watertown, MA	AMRR	5,000.0	60.00	70.00	Pool. BAC		Army Materials and Mechanics Research Center. License terminated 10/5/93.
Diamond Ordnance Radiation Facility (USA). Forest Glen, MD	DORF	250.0	61.00	77.00	TRIGA-Mk F. GA		Harry Diamond Laboratories.
Naval Research Reactor (USN). Regulated by NRC. Washington, DC	NRR	1,000.0	56.00	70.00	Pool. NRL		
Nuclear Effects Reactor (DOE). NTS, NV	Super KUKLA		64.00	79.00	Prompt burst. LLNL		Standby fuel in storage at ORNL.
Thermal Test Reactor No. 1 (DOE). Schenectady, NY	TTR-1	10.0	51.00	83.00	Graphite. KAPL		
Walter Reed Research Reactor (USA). Regulated by NRC. Washington, DC	WRRR	50.0	62.00	70.00	Homogeneous. AI		Walter Reed Army Institute of Research.

#### 1. POWER REACTORS

#### A. Central-Station Electric Power Plants

Reactor Name (Owner). Location	NRC export license No.	Principal nuclear contractor.	Power design net MW(e)	Power net MW(t)	Authorized power kW(t)	Initial criticality (yr mo)	Shut-down (yr mo)	Comment
France (Franco-Belgian Society for Nuclear Energy of Ardennes, SENA). Chooz Germany, Kahl Nuclear Power Station (Rhine-Westphalia Power Co., RWE). Kahl-am-Main	XR-031 09/30/59	GE. Boiling water	305.0	1,040.0	67.00	91.10	91.10	Decommissioning in process.
Germany (Kernkraftwerk-RWE-Bayenwerk, KRB1). Gundremmingen (near Günzburg)	XR-052 05/28/64	GE. Boiling water	237.0	801.0	67.00	80.00	80.00	
Italy, Ganglano Nuclear Power Station (Project ENEL of SENN).	XR-043 08/16/61	GE. Boiling water	150.0	506.0	64.00	78.00	78.00	
Japan, Japan Power Demonstration Reactor (JAERI). Tokai-Mura, Ibaraki Pref.	XR-045 03/16/62	GE. Boiling water	12.0	90.0	63.00	83.00	83.00	

#### B. Propulsion

Great Britain, S5W for HMS DREADNOUGHT.	West. Pressurized water	62.00
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West. Pressurized water

Westinghouse was the designer of the reactor.  
Designation: S5W. No power levels available.  
As of 2/90 the reactor has been defueled  
and is not in operational condition.

#### PART IV EXPORT REACTORS

## 2. TEST, RESEARCH, AND TEACHING

### A. General Irradiation Test

(No reactors currently in this category)

### B. General Research

Belgium, BR-3, Mol (AMITAS). Mol	XR-024 11/06/58	Pressurized water	10.5	
Denmark, DR-2 (Risø National Laboratory). Risø	XR-006 04/04/57	FW. Tank	5,000.0	58 00
Germany, FRG-1 (CKSS-Forschungszentrum Geesthacht G.m.b.H.). Geesthacht	XR-008 06/10/57	B&W. Research Reactor	5,000.0	58 10
Italy (Center for Military Application of Nuclear Energy). Near Pisa	XR-036 12/17/59	B&W. Pool	63 00	80 00
Italy (European Community Commission). Ispra	XR-007 05/17/57	AC. Heavy water, tank AMF. Pool	5,000.0	59 00
Italy (Fiat TTG). Saluggia	XR-016 12/06/57	AMF. Pool	7,000.0	59 00
Italy (Italian Agency for New Technology, Energy and the Environment). Casaccia	XR-051 04/20/64	AI. L-54	71 00	79 00
Japan (Japan Atomic Energy Research Institute). Tokai-Mura, Ibaraki Pref.	XR-001 11/02/56	GA.	50.0	57 00
Vietnam (Vietnam Institute of Nuclear Research). Dalat	XR-032 10/10/59	TRIGA-Mk II	250.0	63 00
West Berlin, City of (Institute for Nuclear Research). West Berlin	XR-012 09/07/57	AI. L-54	50.0	58 00
				70 00

### C. University Research and Teaching

Germany (Association for Radiation Research). Munich	XR-075 01/14/71	GA. TRIGA-Mk III	1,000.0	72 00	82 00	This reactor was sold through Gulf Oil licensee, Gutheilfungsstuhle Sterkade A.E.
Germany (Brown Boveri/Knipp). Jülich	XR-062 07/28/66	AI. L-77A	64.00	77 00		This L-77 reactor was operated in the commercial exhibit of the 1958 International Conference in Geneva and in the USAEC Atoms for Peace Exhibits in Beirut, Lebanon, 10/61; in Athens, Greece, 5/62, and in Bangkok, Thailand, 11/62.
Germany (Universities of Frankfurt and Darmstadt). Frankfurt	XR-009 05/01/57	AI. L-54	50.0	58 00	68 00	
Italy (University of Milan). Milan	XR-022 08/13/58	AI. L-54	50.0	59 00	86 00	
Switzerland (University of Geneva). Geneva	AGN. AGN-201-111		58 00	87 00		Negligible power. The AGN-201-111 was operated first in the USAEC Atoms for Peace Exhibit in Rome, Italy, 7/58, and later in the commercial exhibit of the 1958 International Conference in Geneva prior to transfer to the University of Geneva.
United Kingdom (Queen Mary College, London University). London	XR-049 02/13/64	AS Inc. UTR-B	100.0	65 00	82 00	

## 1. CIVILIAN

## PART V CRITICAL ASSEMBLIES

### Equipment

Facility (Regulatory Agency)	Designation	Location	No. of cells	No. control panels/room	Abbreviation	Initial criticality (yr mo)	Shut-down (yr mo)	Comment
Argonne National Laboratory (DOE)	ZPR-6	Argonne, IL	2	2	ANL	63 00	82 00	Basic fast reactor studies and mock-up for LMFBR.
Argonne National Laboratory (DOE)	ZPR-9	Argonne, IL	2	2	ANL	67 00	82 00	Basic fast reactor studies and mock-up for LMFBR.
								Zero-power experiments of historical interest previously conducted in ANL facility cells include the NAUTILUS core design (ZPR-1), the Savannah River reactor design (ZPR-2), and a series of fast-neutron studies (ZPR-4) and interactions between two basic systems (ZPR-5). The following experiments were performed in the ZPR-7 facility: thorium, uranium, deuterium criticals (THUD), and a series of flux trap criticals for the Argonne High Flux Research Reactor. LWB Physics.
Bettis Atomic Power Laboratory (DOE)	LWBCC	Pittsburgh, PA	3	3	Bettis	63 00	80 00	
Critical Facility-10, Lynchburg Research Center (NRC)	SSRF	Lynchburg, VA	2	1	CX-10	77 00	88 02	Close storage of spent reactor fuel. License terminated 2/88.
Los Alamos National Laboratory (DOE)	Parka	Los Alamos, NM	3	3	LANL, Kiva III	63 00	85 00	Cold critical for instrumentation testing. Defueled.
Los Alamos National Laboratory (DOE)	Venus	Los Alamos, NM	1	1	LANL, Kiva I	76 00	88 00	Vertical table assembly machine.
Oak Ridge Critical Experiments Facility (DOE)	CEF	Oak Ridge, TN	1	1	OR-CEF	50 00	92 00	Shut down—Defueled.
ORNL Pool Critical Assembly, BSF Pool (DOE)	PCA	Oak Ridge, TN	1	1	ORNL-PCA	58 00	92 00	Shut down—To be defueled.
PNL Critical Mass Laboratory (DOE)	FEAS	Hanford Site, WA	1	1	PNL-CML	76 00	90 00	The Critical Mass Laboratory was used to experiment with liquid plutonium solutions. It was shut down in 1990 and transferred to the surplus facilities program for decontamination and decommissioning. See FEAS reactor.
PNL Critical Mass Laboratory (DOE)	Horizontal RSTM	Hanford Site, WA	1	1	PNL-CML	61 00	90 00	
PNL Critical Mass Laboratory (DOE)	PTF	Hanford Site, WA	4	3	PNL-CML	63 00	90 00	
United Nuclear Corporation, Development Division (NRC)		Pawling, NY			UNC	67 00	72 00	
								Proff test facility. Material license (SNM-871) terminated 7/14/75.

## 2. MILITARY

Bettis Atomic Power Laboratory (DOE)	HTTF	Pittsburgh, PA	Bettis	59 00	84 00	Surface-ship physics.
Bettis Atomic Power Laboratory (DOE)	SS-CF	Pittsburgh, PA	Bettis	57 00	76 00	Surface-ship physics.
Knolls Atomic Power Laboratory (DOE)	FPR	Schenectady, NY	KAPL	56 00	75 00	Flexible critical experiments.
Knolls Atomic Power Laboratory (DOE)	PTR	Schenectady, NY	KAPL	58 00	76 00	High-temperature high-pressure physics and mock-up.
Lockheed Aircraft Co., Critical Facility for RER (NRC)	CERF	Dawsonville, GA	Lockheed	58 00	60 09	
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Vertical/ Split Table	Golden, CO	RFP-NSF	65 00	92 00	Critical-configuration safety tests.
Nuclear Safety Facility, Rocky Flats Plant (DOE)	Water	Golden, CO	RFP-NSF	65 00	92 00	Critical-configuration safety tests.
	Reflector Tank					

# **REACTOR INDEX**



## REACTOR INDEX

AIW, 15

ABRAHAM LINCOLN

CVN72 (2 reactors), 14

SSBN602, 41

Accelerator Pulsed Fast Critical Assembly, 33

ACF Industries, Inc., Massachusetts Institute of Technology, 9

ACPR, 33

ACRR, 8

Advanced Energy Research Institute, Korea

TRIGA-Mk II, 21

TRIGA-Mk III, 21

Advanced Neutron Source Reactor, 8

Advanced Reactivity Measurement Facility, 8

Advanced Test Reactor, 7

Advanced Test Reactor Critical Facility, 23

Aerojet-General Corporation

Ground Experimental Engine Experiment

XE-Backup, 30

XE-Prime, 30

Nuclear Rocket Reactor Experiment (NERVA)

NRX-A2, 30

NRX-A3, 30

NRX-A5:30

NRX-A6:30

Nuclear Rocket Reactor Engine System Test (NERVA), 30

Aerojet-General Nucleonics

Argonne National Laboratory, 33

California Polytechnic State University, 37

Catholic University of America, 37

Colorado State University, 37

Delaware, University of, 37

Gas Cooled Reactor Experiment, 43

Georgia Institute of Technology, 37

Idaho State University, 9

Italy, 23

Korea, 23

Memphis State University, 38

Mobile Low Power Plant No. 1, 43

New Mexico, University of, 10

Oklahoma, University of, 38

Oregon State University, 38

Polytechnic Institute of New York, 38

Switzerland

Basel, University of, 23

Geneva, University of, 45

Texas A&M University, 10

Tuskegee Institute, 39

Utah, University of, 39

West Virginia University, 39

William Marsh Rice University, 39

Aerospace Systems Test Reactor, 43

Aerotest Operations, Inc., 8

AFRRI, 16

AFSR, 34

Aircraft Reactor Experiment, 43

ALABAMA, 13

ALASKA, 13

Albania, 22

ALBANY, 14

ALBUQUERQUE, 13

Alco Products, Inc.

Portable Medium Power Plant, No. 2A, 40

Stationary Medium Power Plant

No. 1, 41

No. 1A, 41

ALEXANDER HAMILTON, 42

ALEXANDRIA, 14

Allis-Chalmers Mfg. Co.

Experimental Gas Cooled Reactor, 28

Italy, 45

La Crosse (Genoa) Nuclear Generating Station, 25

Netherlands, 20

Nuclear Engineering Test Reactor, 43

Pathfinder Atomic Plant, 25

South Africa, Safari-1, 20

Sweden, 20

Almaraz

Unit 1, 18

Unit 2, 18

ALRR, 32

Alvin W. Vogtle Nuclear Plant

Unit 1, 1

Unit 2, 1

American Radiator

Australia, Moata, 20

Japan, 23

American Standard Inc.

American Standard Inc., 33

Iowa State University, 9

United Kingdom, 45

Virginia Polytechnic Institute, 39

Ames Laboratory Research Reactor, 32

AMF Atomics, Inc.

Ames Laboratory Research Reactor, 32

Austria, Astra, 20

Battelle Memorial Institute, 33

California, Los Angeles, University of, School of Engineering and Applied Science, 37

Canada, 22

Cinuchem, Inc. Reactor, 32

Germany, FRM Gersching, 22

Greece, Democritos, 21

Industrial Reactor Laboratories, Inc., 32

Iran, 23

Israel, 21

Italy Casaccia, 45

Saluggia, 45

Japan, JRR-2, 20

Manhattan College, 9

Netherlands, 23

New York, State University of, 10

North Carolina State University, 10

Pakistan, PARR, 21

Portugal, RP-1, 21

Turkey, 21

Washington, University of, 39

AMITAS, Belgium, BR-3, Mol, 45

AMRR, 44

ANDREW JACKSON, 42

Angra 1, Central Electricia de Fumas, 16

ANNAPOLIS, 14

Annular Core Pulsed Reactor, 33

ANS, 8

APFA-III, 33

APRF, 16

ARCHERFISH, 12

ARE, 43

Argonaut (CP-11), 33

Argonne CP-3, rebuilt as CP-3', 33

Argonne Low Power Research Reactor, 33

Argonne National Laboratory, 33

Argonne Low Power Research Reactor, 33

Argonne Nuclear Assembly for University Training, 33

Argonne Research Reactor, 32

Argonne Thermal Source Reactor, 33

Biological Research Reactor, 33

Boiling Reactor Experiment No. 1, 27

Boiling Reactor Experiment No. 5, 27

Boiling Reactor Experiments, 27

Experimental Breeder Reactor No. 1, 18

Experimental Breeder Reactor II, 6

Experimental Boiling Water Reactor, 27

Fast Source Reactor, 34

Idaho Division, ZPPR, 23

Neutron Radiography Facility, 8

Stationary Low Power Plant No. 1, 43

Transient Reactor Test, 7

ZPR-6, 46

ZPR-9, 46

Argonne Nuclear Assembly for University Training, 33

Argonne Research Reactor, 32

Argonne Thermal Source Reactor, 33

Arizona, University of, 9

Arizona Public Service Co.,

Palo Verde Nuclear Generating Station

Unit 1, 3

Unit 2, 3

Unit 3, 3

ARKANSAS (2 reactors), 14

Arkansas Nuclear One

Unit 1, 1

Unit 2, 1

Arkansas Tech University, 11

Armed Forces Radiobiology Research Institute, 16

DNA, 16

ARMF, 8

Army Materials and Mechanics Research Center, 44

Army Materials Research Reactor, 44

Army Pulse Radiation Facility, 16

Arnold, Duane Energy Center, Unit 1, 2

ARR (L-54), 35

Asco

Unit 1, 18

Unit 2, 18

ASHEVILLE, 14

ASPRO, 12

Associated Universities, Inc.

Brookhaven Graphite Research Reactor, 33

Brookhaven Neutron Source Reactor

No. 1, 34

No. 2, 34

ASTR, 43

Astra, 20

Ateliers de Constructions Electriques, de Charleroi S.A.

Belgium, Thiane, Unit 1, 16

France, 44

ATLANTA, 13

Atoms International, 33

ATR, 7

## REACTOR INDEX (Continued)

ATRC, 23	BR-3, Mol, 45	Colombia, LAN-R1, 20
ATSR, 33	Braidwood Station	Colorado State University, 37
AUGUSTA, 13	Unit 1, 1	COLUMBIA, 15
Australia	Unit 2, 1	Columbia University, 37
Moata, 20		COLUMBUS, 14
Austria		Comanche Peak Steam Electric Station
Astra, 20	Angra 1, Central Electricia de Fumas, 16	Unit 1, 2
Austria	Minas Gerais, University of, 22	Unit 2, 2
	Sao Paulo, University of, 22	
BREMERTON, 13	BROOKHAVEN Graphite Research Reactor, 33	Combustion Engineering, Inc.
	Brookhaven High Flux Beam Research Reactor, 7	Arkansas Nuclear One, Unit 2, 1
	Brookhaven Medical Research Reactor, 7	Boiling Nuclear Superheater Power Station, 25
BROOKHAVEN National Laboratory	Brookhaven High Flux Beam Research Reactor, 7	Calvert Cliffs Nuclear Power Plant
	Reactor, 7	Unit 1, 1
BROOKHAVEN Neutron Source Reactor	Brookhaven Neutron Source Reactor	Unit 2, 1
	No. 1, 34	Fort Calhoun Station
	No. 2, 34	Unit 1, 2
Brazil	Crystal River Nuclear Plant, Unit 3, 2	Korea
	Davis-Besse Nuclear Power Station, Unit 1, 2	Ulichin 3, 19
	Germany, FRG-1, 45	Ulichin 4, 19
	Indian Point Station, Unit 1, 25	Yonggwang-4, 19
	Italy, 45	Yonggwang-3, 19
	Michigan, University of (Ford Nuclear Reactor), 9	Maine Yankee Atomic Power Plant, 3
Oconee Nuclear Station	BRR, 33	Millstone Nuclear Power Station, Unit 2, 3
	Brunswick Steam Electric Plant	Palisades Nuclear Plant, Unit 1, 3
	Unit 1, 3	Palo Verde Nuclear Generating Station
	Unit 2, 3	Unit 1, 3
	Unit 3, 3	Unit 2, 3
Three Mile Island Nuclear Station	BSR, 34	Unit 3, 3
	BUFFALO, 13	San Onofre Nuclear Generating Station
	Buffalo Materials Research Center, State	Unit 2, 4
	University of New York, 10	Unit 3, 4
	Bulk Shielding Reactor, 34	St. Lucie Plant
	Burns & Roe, Inc., National Institute of Standards & Technology, 7	Unit 1, 4
	Byron Station	Unit 2, 4
	Unit 1, 1	Washington Nuclear Project, Unit 3, 5
	Unit 2, 1	Waterford Generating Station, Unit 3, 5
Virginia, University of, 10		Comet, 23
Washington Nuclear Project, Unit 1, 5		Commonwealth Edison Co.
Babcock & Wilcox		Braidwood Station
Lynchburg Pool Reactor, 33	Unit 1, 1	Unit 1, 1
Nuclear Development Center Test Reactor, 32	Unit 2, 1	Unit 2, 1
BALTIMORE, 13		Byron Station
Baltimore Gas & Electric Co.	C Reactor	Unit 1, 1
	Aiken, 39	Richland, 39
	Unit 1, 1	Calhoun, Fort, Station, Unit 1, 2
	Unit 2, 1	CALIFORNIA (2 reactors), 14
		California
		Berkeley, University of, 37
		Irvine, University of, 9
		Los Angeles, University of, School of Engineering and Applied Science, 37
Bangladesh, 20		Beaver Valley Power Station
BARB, 41		Unit 1, 25
Basel University of, Switzerland, 23		Unit 2, 2
BATFISH, 12		Unit 3, 2
BATON ROUGE, 42		DRUM, 12
Battelle Memorial Institute, 33		Du Pont de Nemours & Company, Inc., E.I., B Reactor
BAWTR, 32		C Reactor, 39
Beaver Valley Power Station		D Reactor, 11
		Experimental Complex, 40
		F Reactor, 39
		Hanford 305 Test Reactor, 40

Unit 1, 1	Santa Barbara, University of, 37	La Salle County Station
Unit 2, 1	California Polytechnic State University, 37	Unit 1, 3
Belgium	Callaway Plant, Unit 1, 1	Unit 2, 3
BR-3, Mol, 45	Calvert Cliffs Nuclear Power Plant	Quad-Cities Station
DoeI	Unit 1, 1	Unit 1, 4
Unit 1, 16		Unit 2, 4
Unit 2, 16	Canada, McMaster University, 22	Zion Nuclear Plant
Unit 4, 16	Caorso Nuclear Station, 17	Unit 1, 5
Tihange	CARL VINSON (2 reactors), 14	Unit 2, 5
Unit 1, 16	Carolina Power & Light Co.	CONNECTICUT, 15
Unit 3, 16	Brunswick Steam Electric Plant	Connecticut Yankee Atomic Power Co., Haddam Neck Plant, 2
Unit 1, 5		Consolidated Edison Co. of New York, Inc.
Unit 2, 5		Indian Point Station, Unit 1, 25
Bendix Aviation Corp.,	H.B. Robinson Plant	Indian Point Station, Unit 2, 2
Army Materials Research Reactor, 44	Unit 1, 1	Consumers Power Co.
Kansas, University of, 38	Shearon Harris Nuclear Power Plant,	Big Rock Point Nuclear Plant, 1
BENJAMIN FRANKLIN, 42	Unit 1, 4	Palisades Nuclear Plant, Unit 1, 3
BERGALL, 12	Carolinas-Virginia Tube Reactor, 25	Consumers Public Power District, Hallam Nuclear Power Facility, Sheldon Station, 25
Bernische Kraftwerke AG, Switzerland,	CASIMIR PULASKI, 42	Cook, Donald C., Nuclear Power Plant
Muhleberg, 18	Catawba Nuclear Station	Unit 1, 2
Bethlehem Steel Co., Shipbuilding Division	Unit 1, 1	Unit 2, 2
USS BAINBRIDGE (2 reactors), 14	Unit 2, 2	Cook Electric Company, North Carolina State University, 38
USS LONG BEACH (2 reactors), 14	CATHOLIC UNIVERSITY OF AMERICA, 37	Cooper Nuclear Station, 2
Bettis Atomic Power Laboratory	CAVALIER, 39	Cornell University, 9
HTTF, 46	CAVALLA, 13	Cornell University Zero Power Reactor, 9
LWBCC, 46	CEEF, 46	Coupled Fast Reactivity Measurement Facility, 8
SS-CF, 46	C.E.N., Maamora, Morocco, 22	CP-2, 34
Beznau	CERF, 46	CP-3', 33
Unit 1, 18	CHICAGO, 13	CP-5, 32
Unit 2, 18	CHARLOTTE, 15	Crystal River Nuclear Plant, Unit 3, 2
BGRR, 33	CHEYENNE, 15	Curtiss-Wright Corporation, Missouri, at Rolla, University of, 9
Big Rock Point Nuclear Plant, 1	CHICAGO, 13	Curtiss-Wright Nuclear Research Laboratory of the Commonwealth of Pennsylvania, 34
Big Ten, 23	Chicago Pile 1, rebuilt as CP-2, 34	CWRR, 34
BILLFISH, 12	China, Republic of, 22	CX, 23
Biological Research Reactor, 33	ChinaShan	DACE, 42
BIRMINGHAM, 13	Unit 1, 18	Dairyland Power Cooperative, La Crosse (Genoa)
Blaw-Knox Co., Materials Testing Reactor, 31	Unit 2, 18	DIG, 15
BLUEFISH, 12	CINCINNATI, 13	DIRECTOR, 39
BMRR, 7	Cinitech, Inc. Reactor, 32	DIG, 15
Boiling Nuclear Superheater Power Station, 25	CITY OF CORPUS CHRISTI, 13	DIRECTOR, 39
Boiling Reactor Experiment	Cleveland Electric Illuminating Co.	DIRECTOR, 39
No. 1, 27	Perry Nuclear Power Plant	DIRECTOR, 39
No. 5, 27	Unit 1, 4	DIRECTOR, 39
Boiling Reactor Experiments, 27	Unit 2, 5	DIRECTOR, 39
BOISE, 14	Clinton Laboratory, Oak Ridge Graphite Reactor, 36	DIRECTOR, 39
BORAX reactors, 27	Clinton Power Station, Unit 1, 2	DIRECTOR, 39
BOSTON, 13	Cofrentes, Unit 1, 18	DIRECTOR, 39
Boston Edison Co., Pilgrim Nuclear Power Station, Unit 1, 4	Darmstadt, Universities of Frankfurt and, ENEL, Italy	DIRECTOR, 39

REACTOR INDEX (Continued)

BERGALL, 12	Garigliano Nuclear Power Station, 44
BILLFISH, 12	Gas Cooled Reactor Experiment, 43
BOSTON, 13	GATO, 12
BREMERTON, 13	General Atomics Technologies, 34
CASIMIR PULASKI, 42	General Atomics Technologies
CAVALLA, 13	Accelerator Pulsed Fast Critical Assembly, 33
CITY OF CORPUS CHRISTI, 13	Advanced TRIGA-Mk F Prototype Reactor, 8
COLUMBIA, 15	Aerotest Operations, Inc., 8
COLUMBUS, 14	Albania, 22
CONNECTICUT, 15	Annular Core Pulsed Reactor, 33
DALLAS, 13	Arizona, University of, 9
DANIEL WEBSTER, 12	Arkansas Tech University, 11
Deep Submersion Research Vehicle, 14	Armed Forces Radiobiology Research
ETHAN ALLEN, 42	Institute, DNA, 16
FLASHER, 42	Austria, 22
FLORIDA, 13	Bangladesh, 20
FLYING FISH, 12	Brazil, 22
FRANCIS SCOTT KEY, 42	California
GEORGE BANCROFT, 42	Berkeley, University of, 37
GEORGE WASHINGTON, 41	Irvine, University of, 9
GLENARD P. LIPSCOMB, 42	Columbia University, 37
GROTON, 13	Cornell University, 9
HARTFORD, 15	Diamond Ordnance Radiation Facility, 44
HELENA, 13	Dow Chemical Co., 8
HENRY L. STIMSON, 42	England, 20
HENRY M. JACKSON, 13	Experimental Beryllium Oxide Reactor, 27
HYMAN G. RICKOVER, 13	Finland, 22
INDIANAPOLIS, 13	Fort St. Vrain Nuclear Generating Station, 25
JACKSONVILLE, 13	Germany
JAMES K. POLK, 12	Hanover, Medical College of, 22
KENTUCKY, 13	Mainz, Johannes Gutenberg University
LA JOLLA, 13	of, 22
LAFAYETTE, 42	Nuclear Medicine, Institute for, 22
LOUISIANA, 15	Radiation Research, Association for, 45
LOUISVILLE, 13	Illinois, University of, 9
MAINE, 15	Indonesia
MARYLAND, 13	Bandung, 21
MIAMI, 14	Yogyakarta, 21
MICHIGAN, 13	Italy
MINNEAPOLIS-SAINT PAUL, 13	TRIGA-Mk II, XR-026, 21
NARWHAL, 12	TRIGA-Mk II, XR-056, 23
NATHAN HALE, 42	Japan
NEBRASKA, 13	NSRR, 20
NEVADA, 13	TRIGA-Mk II, XR-037, 23
NEW YORK CITY, 13	TRIGA-Mk II, XR-038, 23
OHIO, 13	Kansas State University, 9
OMAHA, 13	Korea
OMAHA, 13	TRIGA-Mk II, XR-027, 21
OMAHA, 13	Unit 1, 1
OMAHA, 13	Unit 2, 1
OMAHA, 13	C Reactor, 39
OMAHA, 13	China, Republic of, 22
OMAHA, 13	Clinton Power Station, Unit 1, 2
OMAHA, 13	Cooper Nuclear Station, 2
OMAHA, 13	Destroyer Reactor Prototype, 15
OMAHA, 13	DR Reactor, 39
OMAHA, 13	Dresden Nuclear Power Station
OMAHA, 13	Unit 1, 25
OMAHA, 13	Unit 2, 2
OMAHA, 13	Unit 3, 2
OMAHA, 13	Duane Arnold Energy Center, Unit 1, 2
OMAHA, 13	Edwin L. Hatch Nuclear Plant
OMAHA, 13	Unit 1, 2
OMAHA, 13	Unit 2, 2
OMAHA, 13	Engineering Test Reactor, 31
OMAHA, 13	Enrico Fermi Atomic Power Plant
OMAHA, 13	ESADA Vallecitos Experimental Superheat Reactor, 27
OMAHA, 13	General Electric Nuclear Test Reactor, 8
OMAHA, 13	Kemkraftwerk-RWE-Bayennwerk, 44
OMAHA, 13	KRBLI, 44
OMAHA, 13	Grand Gulf Nuclear Station, Unit 1, 2
OMAHA, 13	H Reactor, 39
OMAHA, 13	Hope Creek Nuclear Generating Station, Unit 1, 2
OMAHA, 13	Humboldt Bay Power Plant, Unit 3, 25
OMAHA, 13	India
OMAHA, 13	Tarapur Nuclear Power Station
OMAHA, 13	Unit 1, 17
OMAHA, 13	Unit 2, 17
OMAHA, 13	Italy
OMAHA, 13	Caorso Nuclear Station, 17
OMAHA, 13	Garigliano Nuclear Power Station, 44
OMAHA, 13	James A. FitzPatrick Nuclear Power Plant, 3
OMAHA, 13	Japan
OMAHA, 13	Fukushima Dai-ichi Power Station
OMAHA, 13	Unit 1, 17
OMAHA, 13	Unit 2, 17
OMAHA, 13	Unit 6, 17
OMAHA, 13	Japan Power Demonstration Reactor, 44
OMAHA, 13	Kashiwazaki-Kariwa
OMAHA, 13	Unit 6, 19
OMAHA, 13	Unit 7, 19
OMAHA, 13	Tokai No. 2 Power Station, 17
OMAHA, 13	Tsuringa Power Station, Unit 1, 17

Unit 1, 25	TRIGA-Mk III, XR-073, 21
Unit 2, 2	PASADENA, 14
FFTF, 31	PATRICK HENRY, 41
Fiat TTG, Italy, 45	PENNSYLVANIA, 13
FINBACK, 12	PHILADELPHIA, 13
Finland, Institute of Technology, 22	PHOENIX, 13
FitzPatrick, James A., Nuclear Power Plant, 3	PITTSBURGH, 13
FLASHER, 42	PORTSMOUTH, 13
Flatop, 23	PROVIDENCE, 13
FLORIDA, 13	RHODE ISLAND, 15
Florida, University of, 9	SAN JUAN, 14
Florida Power & Light Co.	SANTA FE, 14
St. Lucie Plant	SCORPION, 41
Unit 1, 4	SEA HORSE, 12
Turkey Point Plant	SEAWOLF PWR, 41
Unit 2, 4	SEAWOLF Sodium Reactor, 41
Unit 3, 5	SEAWOLF, 15
Unit 4, 5	SILVERSIDES, 12
Florida Power Corp., Crystal River Nuclear Plant, Unit 3, 2	SKATE, 41
Fluor Corporation, Ltd., Experimental Organic Cooled Reactor, 28	SKIPJACK, 41
FLYING FISH, 12	SPRINGFIELD, 14
FNR, 9	STURGEON, 12
Ford Nuclear Reactor, Michigan, University of, 9	TECUMSEH, 42
Fort Calhoun Station, Unit 1, 2	TENNESSEE, 13
Fort St. Vrain Nuclear Generating Station, 25	THOMAS A. EDISON, 42
Foster Wheeler Corp.	TOPEKA, 14
Denmark, DR-2, 45	TREPANG, 12
Livermore Pool Type Reactor, 35	TRITON (2 Reactors), 41
FPR, 46	TULLIBEE, 41
Fraternome	ULYSSES S. GRANT, 42
Tihange, Unit 1, 16	WEST VIRGINIA, 13
France, 44	WYOMING, 15
FRAN, 35	Quincy Division
France, Franco-Belgian Society for Nuclear Energy of Ardennes, SENA, 44	GATO, 12
FRANCIS SCOTT KEY, 42	GREENLING, 42
Frankfurt and Darmstadt, Universities of, Germany, 45	SUNFISH, 12
FRG-1, 45	WHALE, 12
FRM Gersching, 22	General Electric Company
Fuel Element Test Bed, 30	ANPD
Fuel Element Test Reactor	Heat Transfer Reactor Experiment
Pewee-1, 30	No. 1, 43
Pewee-2, 30	No. 2, 43
Fukushima Dai-ichi Power Station	No. 3, 43
Unit 1, 17	Big Rock Point Nuclear Plant, 1
Unit 2, 17	Browns Ferry Nuclear Power Station
Unit 6, 17	Unit 1, 1
	Unit 2, 1
	Unit 3, 1
	Unit 4, 1
	Unit 5, 1
	Unit 6, 1
	Unit 7, 1
	Unit 8, 1
	Unit 9, 1
	Unit 10, 1
	Unit 11, 1
	Unit 12, 1
	Unit 13, 1
	Unit 14, 1
	Unit 15, 1
	Unit 16, 1
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	Unit 19, 1
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	Unit 32, 1
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	Unit 121, 1
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	Unit 131, 1
	Unit 132, 1
	Unit 133, 1
	Unit 134, 1
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	Unit 483, 1
	Unit 484, 1
	Unit 485, 1
	Unit 486, 1
	Unit 487, 1
	Unit 488, 1
	Unit 489, 1
	Unit 490, 1
	Unit 491, 1

## REACTOR INDEX (Continued)

Muhleberg, 18	HE: Sevillana de Electricidad, Spain, Valdecaballeros	Kiwi-B1A, 31
Taiwan	Unit 1, 19	Kiwi-B1B, 31
Chinshan	Unit 2, 19	Kiwi-B4A, 31
Unit 1, 18	Health Physics Research Reactor, 34	Kiwi-B4D, 31
Unit 2, 18	Heat Transfer Reactor Experiment	Kiwi-B4E, 31
Kuo Sheng	No. 1, 43	Kiwi-Transient Test Reactor, 32
Unit 1, 19	Unit 2, 19	Kiwi-TTR, 32
Unit 2, 19	No. 2, 43	Knolls Atomic Power Laboratory
Trident Prototype, 15	No. 3, 43	FCEP, 24
Vallecitos Boiling Water Reactor, 29	Heavy Water Components Test Reactor, 28	FPR, 46
Venezuela, 22	HELENA, 13	PTR, 46
Vermont Yankee Nuclear Power Station, 5	HENRY CLAY, 42	Thermal Test Reactor No. 1, 44
Washington Nuclear Project, Unit 2, 5	HENRY L. STIMSON, 42	Korea
Worcester Polytechnic Institute, 11	HENRY M. JACKSON, 13	Advanced Energy Research Institute
General Electric Nuclear Test Reactor, 8	HFBR, 7	TRIGA-Mk III, 21
General Electric Testing Reactor, 31	HFR, 7	TRIGA-Mk II, 21
General Nuclear Engineering Corp.	Hidroelectrica Espanola S.A., Spain, Cofrentes, Unit 1, 18	Kori-1, 17
Florida, University of, 9	High Temperature Lattice Test Reactor, 34	Kori-2, 17
Georgia Institute of Technology, 9	HATCH, 41	Kori-3, 17
Geneva, University of, Switzerland, 45	JACKSONVILLE, 13	Kori-4, 17
GEORGE BANCROFT, 42	Kashiwazaki-Kariwa, Unit 7, 19	Kyung Hee, University of, 23
GEORGE C. MARSHALL, 42	Tokai No. 2 Power Station, 17	Uichin 3, 19
GEORGE WASHINGTON, 41	Homogeneous Reactor Experiment	Uichin 4, 19
GEORGE WASHINGTON (2 reactors), 14	No. 1, 28	Yonggwang-1, 17
GEORGE WASHINGTON CARVER, 42	Honeycomb, 23	Yonggwang-2, 17
GEORGEIA, 13	HONOLULU, 13	Yonggwang-3, 19
Georgia Institute of Technology	Horizontal, 46	Yonggwang-4, 19
AGN-201-104, 37	Horizontal/Split Table, 24	James A. Fitzpatrick Nuclear Power Plant, 3
GTRR, 9	HOUSTON, 13	JAMES K. POLK, 12
Georgia Power Co.	Houston Lighting & Power Co., South Texas Project	JAMES MADISON, 42
Alvin W. Vogtle Nuclear Plant	Unit 1, 4	JAMES MONROE, 42
Unit 1, 1	Unit 2, 4	JANUS, 33
Unit 2, 1	Horizontal, 46	Fukushima Dai-ichi Power Plant
Edwin I. Hatch Nuclear Plant	Horizontal/Split Table, 24	Unit 1, 17
Unit 1, 2	HOUSTON, 13	Unit 2, 17
Germany	Houston Lighting & Power Co., South Texas Project	KUHLA, 35
Association for Radiation Research, 45	Unit 1, 4	Kuo Sheng
Frankfurt and Darmstadt, Universities of, 45	Unit 2, 4	Unit 1, 19
FRG-1, 45	HPRR, 34	Unit 2, 19
FRM Gersching, 22	HRE-1, 28	KW Reactor, 39
Hanover, Medical College of, 22	HRE-2, 28	Kyung Hee, University of, Korea, 23
Kahl Nuclear Power Station, 44	HTLIR, 34	L Reactor, 39
Kemkraftwerk-RWE-Bayemwerk, KRBI, 44	HTRE, 40	L. MENDELL RIVERS, 13
Mainz, University of, 22	HTRE-1, 43	La Crosse (Genoa) Nuclear Generating Station, 25
Mulheim-Kaerlich, 16	HTRE-2, 43	LA JOLLA, 13
Nuclear Medicine, Institute for, 22	HTRE-3, 43	La Salle County Station
GETR, 31	HTTF, 46	Unit 1, 3
Ginna, Robert Emmett, Nuclear Power Plant, Unit 1, 4	Humboldt Bay Power Plant, Unit 3, 25	Unit 2, 3
	HWCTR, 28	LAFA YETTE, 42

GNK, Netherlands, Dodewaard, 17	HYMAN G. RICKOVER, 13	Takahama Power Station, Unit 1, 17
GKSS-Forschungszentrum Geesthacht G.m.b.H., Germany, FRG-1, 45	HYPO, 35	Tokai No. 2 Power Station, 17
GLENARD P. LIPSCOMB, 42	IAN-R1, 20	Tsuruga Power Station, Unit 1, 17
Godiva-IV, 23	Idaho Nuclear Corporation, Special Power	Japan Power Demonstration Reactor, 44
GPU Nuclear Corp.	Excursion Reactor Test No. 4, 33	JEFFERSON CITY, 14
Oyster Creek Nuclear Power Plant, Unit 1, 3	JOHN C. CALHOUN, 42	JOHN ADAMS, 42
Three Mile Island Nuclear Station	Idaho State University, 9	JOHN C. CALHOUN, 42
Unit 1, 5	Illinois, University of,	JOHN C. STENNIS, 15
Unit 2, 26	LOPRA, 9	JOHN MARSHALL, 42
Grand Gulf Nuclear Station, Unit 1, 2	TRIGA-Mk II, 9	Joseph M. Farley Nuclear Plant
GRAYLING, 12	Illinois Institute of Technology Research	Unit 1, 3
Great Britain, SSW for HMS DREADNOUGHT,	Institute, 35	Unit 2, 3
44	Illinois Power Co., Clinton Power Station,	Jose Cabrala, 18
Greece, Democritos, 21	Unit 1, 2	Juggernaut, 33
GREENLING, 42	Imperial Chemical Industries, England, 20	KRR-2, 20
GREENVILLE, 15	India, Tarapur Nuclear Power Station,	KUKLA, 35
GROTON, 13	Unit 1, 17	FRAN, 35
Ground Experimental Engine Experiment	Unit 2, 17	Super KUKLA, 44
XE-Backup, 30	Indian Point Station	Leibstadt, 18
XE-Prime, 30	Unit 1, 25	Leland Stanford University, 38
Ground Test Reactor, 43	Unit 2, 2	Lemoniz, Unit 1, 19
GTR, 43	Unit 3, 3	Lemoniz, Unit 2, 19
GUARDFISH, 42	Indiana and Michigan Electric Co., Donald C.	LEWIS AND CLARK, 42
GTRR, 9	Cook Nuclear Power Plant	Limerick Generating Station
GUTTARRO, 42	Unit 1, 2	Unit 1, 3
Gulf States Utilities Co., River Bend Station,	Unit 2, 2	LITR, 35
Unit 1, 4	INDIANAPOLIS, 13	Livermore Pool Type Reactor, 35
GURNARD, 12	Indonesia	Livermore Water Boiler, 35
H Reactor, 39	Bandung, 21	LIWB, 35
H.B. Robinson Plant, Unit 2, 2	Yogyakarta, 21	Lockheed Aircraft Co., Critical Facility for RER,
Haddam Neck Plant, 2	Industrial Reactor Laboratories, Inc., 32	46
HADDO, 41	Ingalls Shipbuilding Corp.	Lockheed Aircraft Corp.
HADDOCK, 42	ASPRO, 12	Colombia, IAN-R1, 20
HALIBUT, 41	BARB, 41	DOE Demonstration Reactor, 34
Hallam Nuclear Power Facility, Sheldon Station,	DACE, 42	European-Asian Exhibit Program, 34
25	HADDOCK, 42	Lockheed Aircraft Corp., 35
HAMMERHEAD, 12	PARCHE, 13	NASA Mock-Up Reactor, 35
HAMPTON, 14	POGY, 12	Ohio State University, 10
Hanford 305 Test Reactor, 40	PUFFER, 12	Purdue University, 10
Hanover, Medical College of, Germany, 22	SCULPIN, 41	Radiation Effects Reactor, 36
Harris, Shearon, Nuclear Power Plant, Unit 1, 4	SNOOK, 41	LOFT, 32
Ordnance Radiation Facility, 44	TAUTOG, 12	London University, Queen Mary College, United
HARTFORD, 15	TUNNY, 13	Kingdom, 45
Hatch, Edwin I., Nuclear Plant	WILLIAM H. BATES, 12	LONG BEACH (2 reactors), 14
Unit 1, 2	Kinki University, 23	Long Island Lighting Co., Shoreham Nuclear
Unit 2, 2	Kiwi-A, 30	Power Station, 26
HAWKBILL, 12	Kiwi-A Prime, 30	LOPO, 35
	Kiwi-A3, 30	LOPRA, 9

## REACTOR INDEX (Continued)

Los Alamos Fast Reactor, 35	Massachusetts, University of, 9	POLLACK, 41	Unit 2, 3
Los Alamos LOPO Reactor, 35	Materials Testing Reactor, 31	TRUXTUN (2 reactors), 14	Unit 3, 3
Los Alamos Molten Plutonium Reactor Experiment, 28	Maxon Construction Co., Nuclear Engineering Test Reactor, 43	NEWPORT NEWS, 13	Northern States Power Co.
Los Alamos National Laboratory	Unit 1, 5	ABRAHAM LINCOLN (2 reactors), 14	Monticello Nuclear Generating Plant, 3
Big Ten, 23	McGuire, William B., Nuclear Station	ALBANY, 14	Pathfinder Atomic Plant, 25
Comet, 23	Unit 2, 5	ARKANSAS (2 reactors), 14	Prairie Island Nuclear Generating Plant
Flaptop, 23	McMaster University, Canada, 22	ASHEVILLE, 14	Unit 1, 4
Fuel Element Test Bed, 30	MCZPR, 9	ATLANTA, 13	Unit 2, 4
Fuel Element Test Reactor	MEMPHIS, 13	BATON ROUGE, 42	Northrop Corporate Laboratories, 35
Pewee-1, 30	Memphis State University, 38	BIRMINGHAM, 13	NR-1, 14
Pewee-2, 30	Metallurgical Laboratory	BOISE, 14	NRAD, 8
Godiva-IV, 23	Argonne CP-3, rebuilt as CP-3', 33	BUFFALO, 13	NRF, 35
Honeycomb, 23	Chicago Pile 1, rebuilt as CP-2, 34	CALIFORNIA (2 reactors), 14	NRR, 44
King Intense Neutron Generator, 32	Mexico	CARL VINSON (2 reactors), 14	NRX-A2, 30
Kiwi-Transient Test Reactor, 32	Laguna Verde Station	CHARLOTTE, 15	NRX-A3, 30
Los Alamos Fast Reactor, 35	Unit 1, 17	CHEYENNE, 15	NRX-A4/EST, 30
Los Alamos LOPO Reactor, 35	Unit 2, 19	CHICAGO, 13	NRX-A5, 30
Los Alamos Molten Plutonium Reactor Experiment, 28	National Commission for Nuclear Energy, 21	CINCINNATI, 13	NRX-A6, 30
Los Alamos National Laboratory [Planned], 7	MH-1A, 41	DWIGHT D. EISENHOWER (2 reactors), 14	NSRR, 20
Los Alamos Power Reactor Experiment	MIAMI, 14	ENTERPRISE (8 reactors), 14	NTR, 8
No. 1, 28	MICHIGAN, 13	FINBACK, 12	Nuclear Effects Reactor, 35
No. 2, 28	Michigan, University of (Ford Nuclear Reactor), 9	GEORGE C. MARSHALL, 42	KUKLA, 35
Los Alamos Water Boiler	Michigan State University, 38	GEORGE WASHINGTON (2 reactors), 14	Super KUKLA, 44
HYP0, 35	Mihama Power Station, Unit 1, 17	GEORGE WASHINGTON CARVER, 42	Nuclear Engineering Test Reactor, 43
SUP0, 35	Milan, University of, 45	GREENVILLE, 15	Nuclear Reactor Reactor Experiment (NERVA)
Mars, 23	Millstone Nuclear Power Station	HAMMERHEAD, 12	NRXA-2, 30
Nuclear Rocket Reactor Experiment	Unit 1, 3	HAMPTON, 14	NRXA-3, 30
Kiwi-A Prime, 30	Unit 2, 3	HENRY CLAY, 42	NRXA-5, 30
Kiwi-A3, 30	Unit 3, 3	HONOLULU, 13	Nuclear Rocket Reactor Engine System Test (NERVA)
Kiwi-B1A, 31	Minas Gerais, University of, Brazil, 22	HOUSTON, 13	NRXA-4/EST, 30
Kiwi-B1B, 31	MINNEAPOLIS-SAINT PAUL, 13	JAMES MADISON, 42	Kiwi-A, 30
Kiwi-B4A, 31	MISSISSIPPI (2 reactors), 14	JAMES MONROE, 42	Kiwi-Prime, 30
Kiwi-B4D, 31	Mississippi State University, 38	JEFFERSON CITY, 14	Kiwi-A3, 30
Kiwi-B4E, 31	Missouri, University of, 9	JOHN C. CALHOUN, 42	Kiwi-B1A, 31
Phoebus 1A, 31	Missouri at Rolla, University of, 9	JOHN C. STENNIS, 15	Kiwi-B1B, 31
Phoebus 1B, 31	MITR-II, 9	JOHN MARSHALL, 42	Kiwi-B4A, 31
Phoebus 2A, 31	Mitsubishi	KEY WEST, 13	Kiwi-B4D, 31
Omega West Reactor, 7	Mihama Power Station, Unit 1, 17	L. MENDELL RIVERS, 13	Kiwi-B4E, 31
Parke, 46	Oh! Power Station	LAPON, 42	Kiwi-B4F, 31
Planet, 23	Unit 1, 17	LEWIS AND CLARK, 42	Kiwi-B5A, 30
SHEBA, 23	Unit 2, 17	LOS ANGELES, 13	Phoebus 1A, 31
SKUAs, 23	Takahama Power Station, Unit 1, 17	MEMPHIS, 13	Phoebus 1B, 31
Venus, 46	ML-1, 43	MISSISSIPPI (2 reactors), 14	Phoebus 2A, 31
LOS ANGELES, 13	Moata, 20	MONTPELIER, 14	Nuclear Safety Facility, Rocky Flats Plant
Loss of Fluid Test, 32	Mobile Low Power Plant No. 1, 43	NEWPORT NEWS, 13	Horizontal/Split Table, 24
LOUISIANA, 15	Modifications and Additions to Reactor Facility, 15	NIMITYZ (2 reactors), 14	Solution Base, 24
	Molten Salt Reactor Experiment, 28	NORFOLK, 13	Vertical/Split Table, 46
		OKLAHOMA CITY, 13	

Louisiana State University Nuclear Science Center, 35	Monticello Nuclear Generating Plant, 3
LOUISVILLE, 13	MONTPELIER, 14
Low Intensity Test Reactor, 35	Morocco, C.E.N., Maamora, 22
Low Temperature Neutron Irradiation Facility, 35	MISRE, 28
LPTR, 35	MTR, 31
LRP, 33	Mulheim-Kaerlich, 16
LTNF, 35	Munich, Technical University of, Germany, FRM
LTR, 40	Gersching, 22
LWBCC, 46	MUR, 35
Lynchburg Research Center, Critical Facility-10, 46	MURR, 9
	Musashi College of Technology, 23
	Muhleberg, 18
	Maanshan
	Unit 1, 19
	Unit 2, 19
	MAINE, 15
	Maine Yankee Atomic Power Co.,
	Mainz, University of, Germany, 22
	Malaysia, Tun Ismail Atomic Research Centre, 21
	Maine Yankee Atomic Power Plant, 3
	NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, 21
	NATHAN HALE, 42
	NATHANIEL GREENE, 42
	NASA Mock-Up Reactor, 35
	NASA-TR, 31
	NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY, 7
	PLUM BROOK REACTOR FACILITY, 31
	NATIONAL CIRCULATION TEST PLANT, 15
	NAUTILUS, 41
	NAVAL RESEARCH LABORATORY, NAVAL RESEARCH REACTOR, 44
	NEBRASKA, 13
	NEBRASKA PUBLIC POWER DISTRICT, COOPER NUCLEAR STATION, 2
	NETHERLANDS, 12
	DODEWAARD, 17
	ENERGY CENTER, 20
	NETR, 43
	NEUTRON RADIOGRAPHY FACILITY
	NRAD, 8
	NRF, 35
	NEVADA, 13
	NEVADA, UNIVERSITY OF, 38
	NEW MEXICO, UNIVERSITY OF, 10
	NEW YORK CITY, 13
	NEW YORK POWER AUTHORITY
	INDIAN POINT STATION, UNIT 3, 3
	JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 3
	NEW YORK SHIPBUILDING CORP.
	GUARDFISH, 42
	HADDO, 41
	NATIONAL SHIP SAVANNAH, 27
	POGY, 12
	STURGIS FLOATING NUCLEAR POWER PLANT, 41
	MARYLAND, 13
	MARYLAND, UNIVERSITY OF, 9

Louisiana State University Nuclear Science Center, 35	OLYMPIA, 13
LOUISVILLE, 13	QUEENFISH, 42
Low Intensity Test Reactor, 35	RAY, 42
Low Temperature Neutron Irradiation Facility, 35	RICHARD B. RUSSELL, 42
LPTR, 35	ROBERT E. LEE, 41
LRP, 33	SALT LAKE CITY, 13
LTNF, 35	SAM HOUSTON, 42
LTR, 40	SAM RAYBURN, 12
LWBCC, 46	SAN FRANCISCO, 13
Lynchburg Research Center, Critical Facility-10, 46	SCRANTON, 14
	SEA DEVIL, 42
	SHARK, 41
	SIMON BOLIVAR, 12
	SOUTH CAROLINA (2 reactors), 14
	SPADEFISH, 12
	TEXAS (2 reactors), 42
	THEODORE ROOSEVELT (2 reactors), 14
	THOMAS JEFFERSON, 42
	TOLEDO, 15
	TUCSON, 15
	UNITED STATES, 15
	VIRGINIA (2 reactors), 14
	VON STEUBEN, 42
	Niagara Mohawk Power Corp.,
	NINE MILE POINT NUCLEAR STATION
	UNIT 1, 3
	UNIT 2, 3
	NIMMITZ (2 reactors), 14
	NINE MILE POINT NUCLEAR STATION
	UNIT 1, 3
	UNIT 2, 3
	NIST, 7
	NORDOSTSCHWEIZERISCHE KRAFTWERKE AG,
	SWITZERLAND, BEZNAU
	UNIT 1, 18
	UNIT 2, 18
	NORFOLK, 13
	NORTH AMERICA POWER STATION
	UNIT 1, 3
	UNIT 2, 3
	NORTH ATLANTIC ENERGY SERVICE CORP.,
	SEABROOK NUCLEAR STATION, UNIT 1, 4
	NORTH CAROLINA STATE UNIVERSITY
	GRAPHITE/WATER, 38
	PULSTAR, 10
	NORTHEAST NUCLEAR ENERGY CO.,
	MILLSTONE NUCLEAR POWER STATION
	UNIT 1, 3

Louisiana State University Nuclear Science Center, 35	Water Reflector Tank, 46
LOUISVILLE, 13	Nuclear Ship SAVANNAH, 27
Low Intensity Test Reactor, 35	Nuclear Systems Associates, Mississippi State University, 38
Low Temperature Neutron Irradiation Facility, 35	Oak Ridge Critical Experiments Facility, 46
LPTR, 35	Oak Ridge Graphite Reactor, 36
LRP, 33	Oak Ridge Research Reactor, 32
LTNF, 35	Oak Ridge National Laboratory
LTR, 40	Advanced Neutron Source Reactor, 8
LWBCC, 46	Aircraft Reactor Experiment, 43
Lynchburg Research Center, Critical Facility-10, 46	Bulk Shielding Reactor, 34
	Health Physics Research Reactor, 34
	High Flux Isotope Reactor, 7
	Homogeneous Reactor Experiment No. 1, 28
	Homogeneous Reactor Experiment No. 2, 28
	Low Intensity Test Reactor, 35
	Low Temperature Neutron Irradiation Facility, 35
	Materials Testing Reactor, 31
	Molten Salt Reactor Experiment, 28
	Oak Ridge Research Reactor, 32
	SNAP-02/10A TSF Shielding Experiment, 29
	Switzerland, 21
	Tower Shielding Reactor, 36
	Tower Shielding Reactor No. II, 36
	Oconee Nuclear Station
	UNIT 1, 3
	UNIT 2, 3
	UNIT 3, 3
	Ohi Power Station
	UNIT 1, 17
	UNIT 2, 17
	OHIO, 13
	OHIO EISON CO., DUQUESNE LIGHT CO.,
	BEAVER VALLEY POWER STATION, UNIT 1, 1
	OHIO STATE UNIVERSITY, 10
	OKLAHOMA CITY, 13
	OLYMPIA, 13
	OMAHA, 13
	OMAHA PUBLIC POWER DISTRICT,
	FORT CALHOUN STATION, UNIT 1, 2
	OMAHA VETERANS ADMINISTRATION HOSPITAL, 8
	OMEGA WEST REACTOR, 7
	OMRE, 29
	OREGON STATE UNIVERSITY
	AGN-201-114, 38
	OSTR, 10

## REACTOR INDEX (Continued)

ORG, 36	POLLACK, 41	SEAOLF, 15
Organic Moderated Reactor Experiment, 29	Polytechnic Institute of New York, 38	SEAOLF PWR, 41
ORNL Pool Critical Assembly, 46	Portable Medium Power Plant	SEAOLF Sodium Reactor, 41
ORR, 32	No. 1, 40	SEFOR, 29
OSTR, 10	No. 2A, 40	Seibersdorf Research Center, Austria, Astra, 20
OSURR, 10	No. 3A, 41	Sequoia Nuclear Plant
OWR, 7	Portland Electric Co., Trojan Nuclear Plant, Unit 1, 26	Unit 1, 4
Oyster Creek Nuclear Power Plant, Unit 1, 3	PORTSMOUTH, 13	Unit 2, 4
P Reactor, 39	Portsmouth Naval Shipyard	SER, Sandia Engineering Reactor, 32
Pacific Gas & Electric Co.	GRAYLING, 12	SER, SNAP-02 Experimental Reactor, 29
Diablo Canyon Nuclear Power Plant, Unit 1, 2	JACK, 41	SHARK, 41
Humboldt Bay Power Plant, Unit 3, 25	JOHN ADAMS, 42	Shearon Harris Nuclear Power Plant, Unit 1, 4
Pacific Northwest Laboratory	NATHANAEL GREENE, 42	SHEBA, 23
High Temperature Lattice Test Reactor, 34	SAND LANCE, 12	Shield Test and Irradiation Reactor, 36
Physical Constants Test Reactor, 36	SEADRAGON, 41	Shippingport Atomic Power Station, 26
Thermal Test Reactor No. 2, 36	SWORDFISH, 41	Shoreham Nuclear Power Station, 26
Pakistan, PARR, 21	THRESHER, 41	SILVERSIDES, 12
Palemon, University of, 23	TINOSA, 42	SIMON BOLIVAR, 12
Palisades Nuclear Plant, Unit 1, 3	Portugal, RP-1, 21	SKATE, 41
Palo Verde Nuclear Generating Station	Power Reactor Development Company, Enrico	SKIPJACK, 41
Unit 1, 3	Fermi Atomic Power Plant, Unit 1, 25	SKUJA, 23
Unit 2, 3	Power-Burst Facility, 32	SL-1, 43
Unit 3, 3	Prairie Island Nuclear Generating Plant	Slovenia, Josef Stefan Nuclear Institute, 21
PARCHE, 13	Unit 1, 4	Slovenia, Krsko, 18
PARGO, 12	Unit 2, 4	SM-1, 41
Parika, 46	Process Development Pile, 40	SM-1A, 41
PARR, 21	PROVIDENCE, 13	Small Submarine Reactor Prototype, 43
PASADENA, 14	PRR, 36	SNAP-02 Developmental System, 29
Pathfinder Atomic Plant, 25	PRR-1, 21	SNAP-02 Experimental Reactor, 29
PATRICK HENRY, 41	PRTR, 29	SNAP-02/10A TSF Shielding Experiment, 29
Pavia, University of, 23	PSTR, 10	Sodium Reactor Experiment, 29
Pawling Research Reactor, 36	PTF, 46	Walter Reed Research Reactor, 44
PBF, 32	PTR, 46	West Berlin, City of, 45
PCA, 46	Public Service Co. of Colorado, Fort St. Vrain	Wyoming, University of, 39
PCTR, 36	Nuclear Generating Station, 25	Rockwell International, Rhode Island Nuclear
PDP, 40	Public Service Electric & Gas Co.	Science Center, 8
Peach Bottom Atomic Power Station	Hope Creek Nuclear Generating Station	Romania
Unit 1, 25	Unit 1, 2	TRIGA (MPR 16), 20
Unit 2, 3	Unit 1, 4	TRIGA-ACPR, 20
Unit 3, 3	Unit 2, 4	RP-1, 21
Penn State TRIGA Reactor, 10	Salem Nuclear Generating Station	RRR, 38
PENNSYLVANIA, 13	Unit 1, 2	RSTM, 46
Pennsylvania Power & Light Co., Susquehanna	Unit 1, 4	Rural Cooperative Power Association, Elk River
Steel Electric Station	Unit 2, 4	Reactor, 25
Unit 1, 5	L-77, 38	SNARE, 35
Unit 2, 5	TRIGA-FLIP, 38	SNI Annular Core Research Reactor, 8
Pennsylvania State University, Penn State	Puerto Rico Water Resources Authority, Boiling	SNL, 43
TRIGA Reactor, 10	Nuclear Superheater Power Station, 25	SIG, 43
	PUFFER, 12	S2DS, 29
	PULSTAR	S3G, 43

PERMIT, 41	New York, State University of, 10	SSG, 15	Sodium Reactor Experiment, 29
Perry Nuclear Power Plant	North Carolina State University, 10	SSW, 44	Solution Base, 24
Unit 1, 4		SSW for HMS DREADNOUGHT, 44	South Africa, Safari-1, 20
Unit 2, 5		S8DR, 29	SOUTH CAROLINA (2 reactors), 14
Pewee-1, 30		S8ER, 29	South Carolina Electric & Gas Co.,
Pewee-2, 30		S8G, 15	Virgil C. Summer Nuclear Station, Unit 1, 5
PHILADELPHIA, 13		S10FS-1, 29	South Texas Project
Philadelphia Electric Co.		S10FS-3, 29	Unit 1, 4
Limerick Generating Station		S10FS-4, 29	Unit 2, 4
Unit 1, 3		S10FS-5, 29	Southern California Edison
Unit 2, 3		Sacramento Municipal Utility District, Rancho	San Onofre Nuclear Generating Station
Peach Bottom Atomic Power Station		Seco Nuclear Generating Station, Unit 1, 26	Unit 1, 26
Unit 1, 25		Safan-1, 20	Unit 2, 4
Unit 2, 3		Salem Nuclear Generating Station	Unit 3, 4
Unit 3, 3		Unit 1, 4	Southern Nuclear Operating Co., Joseph M.
Philippines, Republic of the		Unit 2, 4	Farley Nuclear Plant
Philippine Nuclear Power Plant, Unit 1, 19		SALT LAKE CITY, 13	Unit 1, 3
PRR-1, 21		SAM HOUSTON, 42	Unit 2, 3
Phillips Petroleum Co.		SAM RAYBURN, 12	Southwest Experimental Fast Oxide Reactor, 29
Nuclear Effects Reactor, 35		SAN FRANCISCO, 13	SP/SE, 40
SNAP-10A Transient Test No. 3, 33		SAN JUAN, 14	SPADEFISH, 12
Special Power Excursion Reactor		San Onofre Nuclear Generating Station	Spain
Test No. 1, 33		Unit 1, 26	Almaraz
Test No. 2, 33		Unit 2, 4	Unit 1, 18
Test No. 3, 33		Unit 3, 4	Unit 2, 18
Phoebus 1A, 31		SAND LANCE, 12	Asco
Phoebus 1B, 31		Sandia Engineering Reactor, 32	Unit 1, 18
Phoebus 2A, 31		Sandia National Laboratories	Unit 2, 18
PHONIX, 13		Louisiana State University Nuclear Science	Cofrentes
PHRENIC, 34		Center, 35	Unit 1, 18
Physical Constants Test Reactor, 36		Sandia Engineering Reactor, 32	Jose Cabral, 18
Pilgrim Nuclear Power Station, Unit 1, 4		Sandia Pulsed Reactor II, 8	Lemoniz
PINTADO, 12		Sandia Pulsed Reactor III, 8	Unit 1, 19
Piqua, City of, Piqua Nuclear Power Facility, 26		SNL Annular Core Research Reactor, 8	Unit 2, 19
Piqua Nuclear Power Facility, 26		SANTA FE, 14	Nuclear Energy Board-JEN, 21
PITTTSBURGH, 13		Santa Maria de Garona, 18	Santa Maria de Garona, 18
Planet, 23		Sao Paulo, University of, Brazil, 22	Valdecaballeros
Plum Brook Reactor Facility, 31		SARGO, 41	Unit 1, 19
PLUNGER, 41		Saxton Nuclear Experimental Reactor Project, 29	Vandellos
Plutonium Recycle Test Reactor, 29		SCAMP, 41	Unit 2, 18
PM-1, 40		SCHIZO, 34	Special Power Excursion Reactor Test
PM-3A, 41		SCORPION, 41	No. 1, 33
PNL Critical Mass Laboratory		SCRANTON, 14	No. 2, 33
FEAS, 46		SCULPTN, 41	No. 3, 33
Horizontal, 46		SEA DEVIL, 42	No. 4, 33
RSTM, 46		SEA HORSE, 12	SPERT-1, 33
POGX, 12		Seabrook Nuclear Station, Unit 1, 4	SPERT-2, 33
Point Beach Nuclear Plant			SPERT-3, 33
Unit 1, 4			
Unit 2, 4			

## REACTOR INDEX (Continued)

SPERT-4, 33	TRIGA-Mk II, 10	England, Sizewell B, 19
SPR, 36	UTR Test Reactor, 36	France, 44
SPR-II, 8	UTR-1, 33	Great Britain, SSW for HMS
SPRINGFIELD, 14	UTR-10	DREADNOUGHT, 44
SR 305-M Test File, 40	Iowa State University, 9	Ground Experimental Engine Experiment
SRE, 29	Virginia Polytechnic Institute, 39	XE-Backup, 30
St. Lucie Plant	UVAR, 10	XE-Prime, 30
Unit 1, 4	Valdecaballeros	H.B. Robinson Plant, Unit 2, 2
Unit 2, 4	Unit 1, 19	Haddam Neck Plant, 2
St. Vrain, Fort, Nuclear Generating Station, 25	Unit 2, 19	Indian Point Station
Standard File/Subcritical Experimental Complex, 40	Vandelllos, Unit 2, 18	Unit 2, 2
State University of New York, 10	Vattenfall AB, Sweden, Ringhals	Unit 3, 3
Stationary Low Power Plant No. 1, 43	Unit 2, 18	Unit 3, 3
Stationary Medium Power Plant	Unit 3, 18	Mihama Power Station, Unit 1, 17
No. 1, 41	Unit 4, 18	Italy, Trino Vercellese, 17
No. 1A, 41	VBWR, 29	Japan
Stationary Neutron Radiography System, 16	Venezuela, Institute for Scientific Research, 22	Unit 1, 17
Stefan, Josef, Nuclear Institute, Slovenia, 21	Venus, 46	Unit 2, 17
STR, 36	Vermont Yankee Nuclear Power Corp., Vermont	Takahama Power Station, Unit 1, 17
STONEWALL JACKSON, 12	Yankee Nuclear Power Station, 5	Joseph M. Farley Nuclear Plant
Studsvik Energimeknik, Sweden, 20	Vertical/Split Table, 46	Unit 1, 3
STURGEON, 12	Vienna Polytechnic Institute, Austria, 22	Unit 2, 3
STURGIS Floating Nuclear Power Plant, 41	Vienna, Vietnam Institute of Nuclear Research, 45	Korea
Submarine Advanced Reactor Prototype, 43	Virgil C. Summer Nuclear Station, Unit 1, 5	Kori-1, 17
Submarine Intermediate Reactor Mark A, 43	Unit 2, 17	Kori-2, 17
Submarine Thermal Reactor Facility, 43	Unit 6, 17	Kori-3, 17
Summer, Virgil C., Nuclear Station, Unit 1, 5	Kashiwazaki-Kariwa	Kori-4, 17
SUNFISH, 12	Unit 6, 19	Yonggwang-1, 17
Super KUKLA, 44	Unit 7, 19	Yonggwang-2, 17
SUPRO, 35	TOLEDO, 15	Large Ship Reactor Prototype (2 reactors), 15
Surry Power Station	Toledo Edison Co., Davis-Besse Nuclear Power	Millstone Nuclear Power Station, Unit 3, 3
Unit 1, 5	Station, Unit 1, 2	N Reactor, 26
Unit 2, 5	TOPEKA, 14	Natural Circulation Test Plant, 15
Susquehanna Steam Electric Station	Torrey Pines, TRIGA-Mk III Reactor, 36	North Anna Power Station
Unit 1, 5	TORY II, 43	Unit 1, 3
Unit 2, 5	TORY IIIC, 43	Unit 2, 3
Sweden, Ringhals	Toshiba	NRX-A-2, 30
Unit 2, 18	Fukushima Dai-ichi Power Station	NRX-A-3, 30
Unit 3, 18	Unit 2, 17	NRX-A-5, 30
Unit 4, 18	Unit 6, 17	NRX-A-6, 30
Switzerland	Kashiwazaki-Kariwa	Nuclear Rocket Reactor Engine System Test
Basel, University of, 23	Unit 6, 19	Philippines, Republic of the Philippine
Beznau	Tower Shielding Reactor, 36	Nuclear Power Plant, Unit 1, 19
Unit 1, 18	Tower Shielding Reactor No. II, 36	Point Beach Nuclear Plant
Unit 2, 18	Transient Reactor Test, 7	Unit 1, 4
Geneva, University of, 45	TREAT, 7	Unit 2, 4
Leibstadt, 18	TREPANG, 12	Prairie Island Nuclear Generating Plant
		Unit 1, 4

Mühleberg, 18	Unit 2, 5
Paul Scherrer Institute, 21	Unit 3, 5
SWORDFISH, 41	Washington Public Power Supply System
	N Reactor, 26
Taiwan	Washington Nuclear Project
Chinshan	Unit 1, 5
Unit 1, 18	Unit 2, 5
Unit 2, 18	Unit 3, 5
Kuo Sheng	Washington State University, 11
Unit 1, 19	Water Reflector Tank, 46
Unit 2, 19	Watts Bar Nuclear Plant
Lungmen	Unit 1, 5
Unit 7, 19	Unit 2, 5
Unit 8, 19	West Berlin, City of, 45
Maanshan	WEST VIRGINIA, 13
Unit 1, 19	West Virginia University, 39
Unit 2, 19	Westinghouse Electric Corporation
Takahama Power Station, Unit 1, 17	Alvin W. Vogel Nuclear Plant
Tarapur Nuclear Power Station	Unit 1, 1
Unit 1, 17	Unit 2, 1
Unit 2, 17	Beaver Valley Power Station
TAUTOG, 12	Unit 1, 1
TECUMSEH, 42	Unit 2, 1
Tehran, University of, Iran, 23	Brazil, Angra 1, Central Eléctrica de Fumas, 16
TENNESSEE, 13	Byron Station
Tennessee Valley Authority	Unit 1, 1
Bellefonte Nuclear Plant	Unit 2, 1
Unit 1, 5	Carolina-Virginia Tube Reactor, 25
Unit 2, 5	Catawba Nuclear Station,
Browns Ferry Nuclear Power Station	Unit 1, 1
Unit 1, 1	Callaway Plant, Unit 1, 1
Unit 2, 1	Carolina-Virginia Tube Reactor, 25
Unit 3, 1	Catawba Nuclear Station,
Unit 1, 4	Unit 1, 1
Unit 2, 4	Unit 2, 2
Unit 1, 5	Comanche Peak Steam Electric Station
TEXAS (2 reactors), 42	Unit 1, 2
Texas	Unit 2, 2
South Texas Project	Ringhals
Unit 1, 4	Unit 2, 18
Unit 2, 4	Unit 3, 18
Texas A&M University	Unit 4, 16
AGN-201M-106, 10	Donald C. Cook Nuclear Power Plant
TRIGA, 10	Unit 1, 2
Texas at Austin, University of,	Unit 2, 2
TRIGA-Mk I, 39	Unit 1, 19
	Unit 2, 19
Trident Prototype, 15	Unit 2, 4
Trino Vercellese, 17	Robert Emmett Gimma Nuclear Power Plant
TRITON (2 Reactors), 41	Unit 1, 4
Trojan Nuclear Plant, Unit 1, 26	Salem Nuclear Generating Station
TRR-1, 21	Unit 1, 4
TRUXTUN (2 reactors), 14	Unit 2, 4
Tsing-Hua University, National, China, Republic of, 22	San Onofre Nuclear Generating Station, Unit 1, 26
TSR, 36	Saxton Nuclear Experimental Reactor Project, 29
TSR-2, 36	Seabrook Nuclear Station, Unit 1, 4
TTR-1, 44	Sequoia Nuclear Plant
TTR-2, 36	Unit 1, 4
TUCSON, 15	Unit 2, 4
TULLIBEE, 41	Shearon Harris Nuclear Power Plant, Unit 1, 4
Tun Ismail Atomic Research Centre, Malaysia, 21	Shippingport Atomic Power Station, 26
TUNNY, 13	Slovenia, Krsko, 18
Turkey	South Texas Project
Atomic Energy Commission, 21	Unit 1, 4
Istanbul, Technical University of, 21	Unit 2, 4
Turkey Point Plant	Spain
Unit 3, 5	Almaraz
Unit 4, 5	Unit 1, 18
Tuskegee Institute, 39	Unit 2, 18
Unit 1, 1	Asco
Unit 2, 1	Unit 1, 18
Unit 2, 1	Unit 2, 18
Unit 1, 1	Unit 1, 19
Unit 2, 1	Unit 2, 19
Unit 1, 1	Vandellos, Unit 2, 18
Unit 2, 1	Submarine Thermal Reactor Facility, 43
Unit 1, 1	Sury Power Station
Unit 1, 5	Unit 1, 5
Unit 2, 5	Sweden
Unit 1, 18	Ringhals
Unit 2, 18	Unit 2, 18
Unit 1, 18	Unit 3, 18
Unit 1, 2	Unit 4, 18
Unit 1, 2	Switzerland
Unit 1, 2	Beznau
Unit 1, 16	Unit 1, 18
Unit 2, 16	Unit 2, 16
Unit 4, 16	Unit 2, 16
Unit 1, 2	Unit 1, 18
Unit 2, 2	Unit 2, 18
Unit 1, 2	Unit 3, 18
Unit 1, 2	Unit 4, 18
Unit 1, 45	Taiwan
University, 45	Maanshan
Unit 1, 1	Unit 1, 19
Unit 1, 1	Unit 2, 19

## REACTOR INDEX (Continued)

Thiange  
    Unit 1, 16  
    Unit 3, 16  
Trojan Nuclear Plant, Unit 1, 26  
Turkey Point Plant  
    Unit 3, 5  
    Unit 4, 5  
Vergil C. Summer Nuclear Station, Unit 1, 5  
Watts Bar Nuclear Plant  
    Unit 1, 5  
    Unit 2, 5  
Westinghouse Nuclear Training Center, 36  
    William B. McGuire Nuclear Station, Unit 2,  
        5  
    Wolf Creek Generating Station, 5  
    Yankee Nuclear Power Station, 26  
    Zion Nuclear Plant  
    Unit 1, 5  
    Unit 2, 5

Westinghouse Hanford Co.  
    Fast Flux Test Facility, 31  
    Neutron Radiography Facility, 35  
    Plutonium Recycle Test Reactor, 29  
    Westinghouse Nuclear Training Center, 36  
    Westinghouse Testing Reactor, 31  
    WHALE, 12  
    WILL ROGERS, 42  
    William B. McGuire Nuclear Station  
        Unit 1, 5  
        Unit 2, 5  
    WYOMING, 15  
    WILLIAM H. BATES, 12  
    William Marsh Rice University, 39  
    Wisconsin, University of, 11  
    Wisconsin Electric Power Co.,  
        Point Beach Nuclear Plant  
        Unit 1, 4  
        Unit 2, 4

Yankee Nuclear Power Station, 26  
    Yankee Atomic Electric Co., Yankee Nuclear  
        Power Station, 26

Yankee Nuclear Power Station, 26  
    Yonggwang-1, 17  
    Yonggwang-2, 17  
    Yonggwang-3, 19  
    Yonggwang-4, 19  
    Zaire, 22  
    Zion Nuclear Plant  
        Unit 1, 5  
        Unit 2, 5  
    ZPPR, 23  
    ZPR, 9  
    ZPR-6, 46  
    ZPR-9, 46







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